

# RADIO AGE

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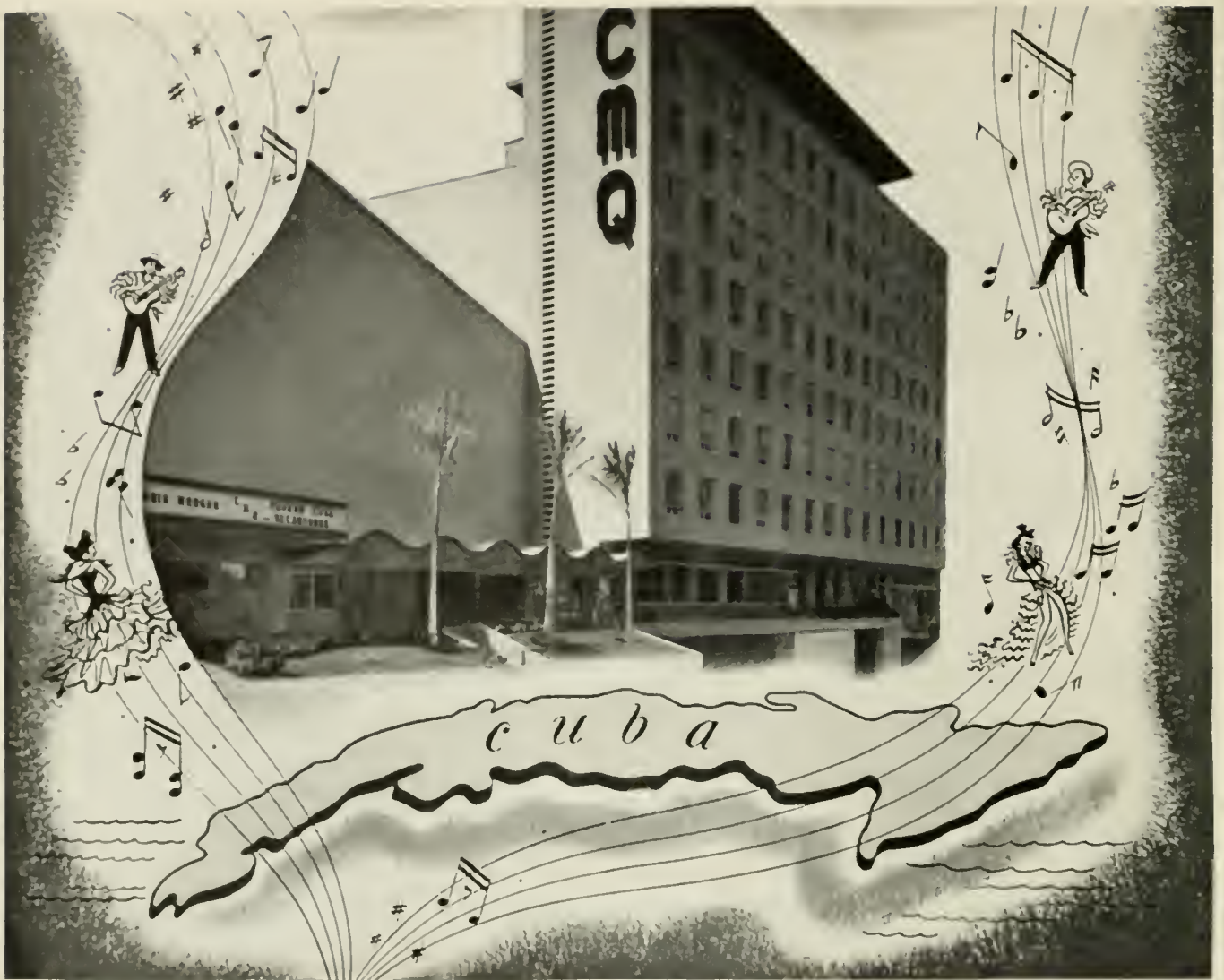
PERIODICAL DEPT



OCTOBER

1948

TASK FORCE  
TV



*Modern, efficient, significant is CMQ's Radiocentro, Havana. It includes —at left, above—glamorous new Warner Bros. theatre, also RCA equipped.*

**VIVA!  
RADIOCENTRO!**

## **Cuba's new voice among the nations**

• Radiocentro, Station CMQ's \$3,000,000 Radio City, is Cuba's new voice among the nations. In it the newest and most efficient broadcasting equipment is beautifully and functionally housed amid fine shops, restaurants, an office building, and the new Warner Bros. theatre, all welded into a great, modern enterprise.

RCA hails the significant trend toward radio centers, such as CMQ, that dramatize the importance of radio to the progress of modern nations

RCA is proud that from microphones to transmission towers, CMQ uses RCA equipment. Around the world the voices of the other great broadcasting stations and networks are RCA equipped, too.

In planning new broadcasting or radio communications facilities, consult your RCA distributor. In radio and electronics, you buy wisely and safely anywhere in the world when the equipment carries the RCA trade mark, symbol of quality and leadership.



**RCA INTERNATIONAL DIVISION**

**RADIO CORPORATION of AMERICA**

745 FIFTH AVE., NEW YORK, N.Y., U.S.A.

Radio address: RADIOINTER, N. Y.

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# RADIO AGE

RESEARCH • MANUFACTURING • COMMUNICATIONS • BROADCASTING • TELEVISION

PERIODICAL DEPT



COVER

An RCA image orthicon television camera sweeps the flight deck of the U.S.S. Leyte during NBC's thrilling telecast from the carrier while it was operating at sea in mock maneuvers.

VOLUME 8 NUMBER 1

OCTOBER 1948

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- RCA Communications, Inc.
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- Radio Marine Corporation of America
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- National Broadcasting Company, Inc.
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- RCA Institutes, Inc.
- 
- RCA Service Company, Inc.
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- RCA International Division

RADIO CORPORATION OF AMERICA

RCA Building, New York 20, N. Y.

DAVID SARNOFF, *President and Chairman of the Board*

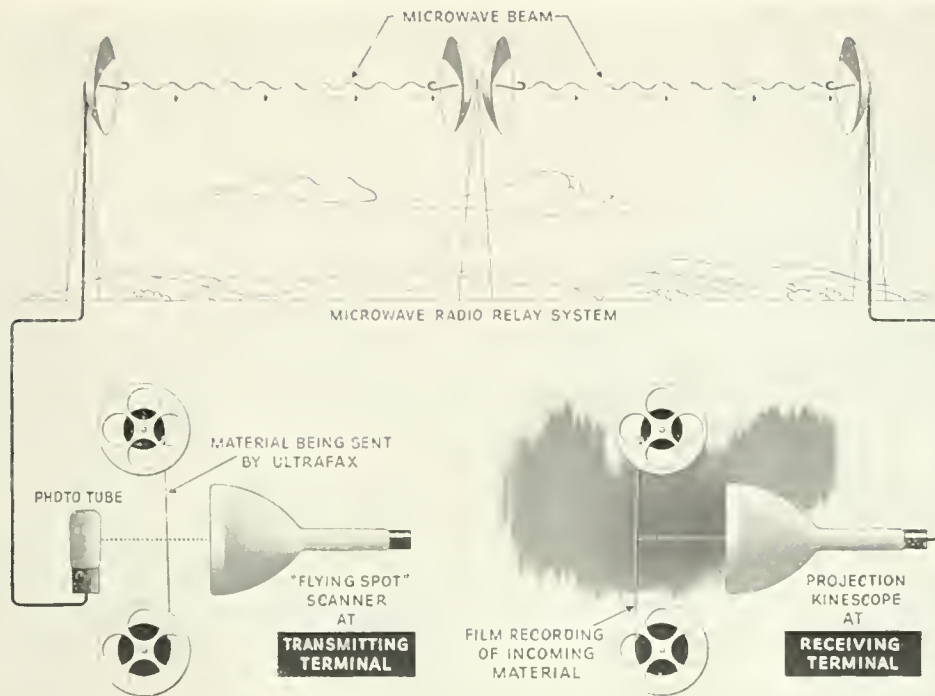
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ONE HUNDRED RCA TELEVISION RECEIVERS INSTALLED ON BOSTON COMMON, MADE IT POSSIBLE FOR TENS OF THOUSANDS OF BASEBALL FANS, UNABLE TO GET INTO BRAVES FIELD, TO WATCH THE THREE WORLD SERIES GAMES PLAYED IN THE MASSACHUSETTS CAPITAL.



PERIODICAL DEPT.

SIMPLIFIED DIAGRAM OF A COMPLETE ULTRAFAX SYSTEM SHOWING THE PRINCIPAL ELEMENTS WHICH MAKE POSSIBLE THE MILLION-WORDS-A-MINUTE TRANSMISSION SPEED OF THE NEWLY DEVELOPED MEDIUM OF COMMUNICATION.

# Ultrafax: Million Words a Minute

*Sarnoff Foresees Ultrafax Opening New Era in National and International Communications—He Urges Study Looking Toward the Establishment of a New National Communications Policy*

ULTRAFAX, a newly developed system of television communications capable of transmitting and receiving written or printed messages and documents at the rate of a million words a minute, was demonstrated publicly for the first time by the Radio Corporation of America at the Library of Congress, Washington, D.C., on October 21.

Brigadier General David Sarnoff, President and Chairman of the Board of RCA, declared that Ultrafax, which splits the seconds and utilizes each fraction for high-speed transmission of intelligence, is as significant a milestone in communications as was the splitting of the atom in the world of energy.

Among the possible developments which General Sarnoff foresaw were:

1. The exchange of international television programs achieved on a transoceanic basis.

2. A service of television and Ultrafax by which the same receiving set would bring various types of publications into the home, or a newspaper for that matter, without interrupting the program being viewed.

3. A system of world-wide military communications for this country, scrambled to the needs of secrecy, which with ten transmitters could carry in sixty seconds the peak load of message traffic cleared from the Pentagon Building in twenty-four hours during the height of World War II.

4. The establishment of great newspapers as national institutions, by instantaneous transmission and

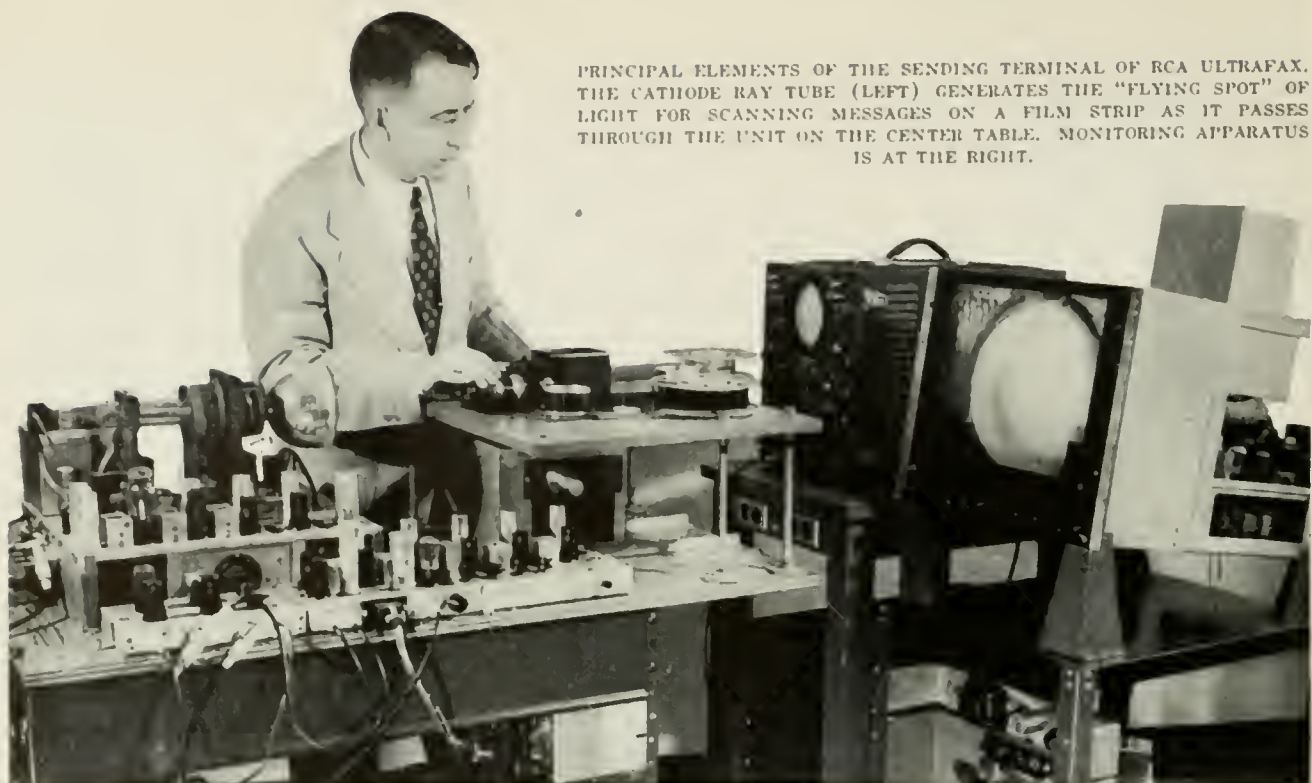
reception of complete editions into every home equipped with a television set.

5. The transmission of a full-length motion picture from a single negative in the production studio simultaneously to the screens of thousands of motion picture theatres throughout the country.

6. The possibility of a new radio-mail system with the vast pickup and delivery services of the Post Office Department.

Representatives of the United States Armed Forces, Government agencies, industry and the press witnessed the introduction of this advanced communications system. RCA presented the demonstration as a "progress report" to show that the system has reached a stage of development where plans can be

PRINCIPAL ELEMENTS OF THE SENDING TERMINAL OF RCA ULTRAFAX. THE CATHODE RAY TUBE (LEFT) GENERATES THE "FLYING SPOT" OF LIGHT FOR SCANNING MESSAGES ON A FILM STRIP AS IT PASSES THROUGH THE UNIT ON THE CENTER TABLE. MONITORING APPARATUS IS AT THE RIGHT.



made for Ultrafax to serve the public.

The demonstration proved the ability of Ultrafax to transmit at the speed of light—186,000 miles a second—a wide variety of graphic material including charts, fingerprints, news and advertising layouts and items ranging from historical documents to complex atomic formulae and battle maps.

A striking feature of the demonstration came when the 1047-page novel "Gone With the Wind" was transmitted word for word in its entirety in about two minutes from the transmitter to the receiver in the Library of Congress.

The Ultrafax system, RCA engineers reported, combines the elements of television with the latest techniques in radio-relaying and high-speed photography. The system is a development of RCA Laboratories, in cooperation with the Eastman Kodak Company and the National Broadcasting Company. Engineers stated that the radio-television-photography combination forms the basis for a system of graphic communication which can be extended from city to city across the nation.

During the demonstration, mes-

sages, technical drawings and other material in foreign languages were among the numerous items transmitted by Ultrafax directly from the tower of the National Broadcasting Company's television station WNBW at the Wardman Park Hotel through the air to a receiving terminal on the stage of the Library of Congress, a distance of three miles. In a regular service the transmissions could be radio-relayed any distance across the country, using the commercial radio-relay system towers which now are being erected to establish national television networks.

Guests at the Coolidge Auditorium were welcomed by the Librarian of Congress, Dr. Luther H. Evans, who said: "I think it eminently fitting that this Library should be the host at a demonstration of this sort. As the principal institution of the nation charged with preserving and making available the printed records of man's communications with his fellows, we are profoundly interested in developments in the art and science of communication."

THIS TINY RCA PHOTOTUBE TRANSFORMS LIGHT VARIATIONS OF ULTRAFAX MESSAGES INTO RADIO SIGNALS.

#### *First Ultrafaxed Messages*

The first message ever publicly transmitted over the Ultrafax system was a handwritten letter by General Sarnoff, congratulating the RCA scientists and engineers who created and developed this new method of radio communications and concluded: "May Ultrafax, as swift as light, open a new and useful service for mankind everywhere."



This message was followed by a transmission of letters from Secretary of Defense James A. Forrestal and Wayne Coy, Chairman of the Federal Communications Commission, addressed to General Sarnoff. Secretary Forrestal stated his interest in the wartime possibilities of Ultrafax, particularly in transmitting combat information to and from commanders in combat areas. Said Secretary Forrestal:

"One of the most important, and not always appreciated, elements of a nation's life is the media of communications. The normal life of an American citizen depends heavily upon these media—in which each segment, such as mail, telephone, telegraph, radio, cables and television—plays an important part.

"In wartime, extra burdens are placed on the existing means of communications, transmitting combat information to and from the commanders in combat areas. Every step which improves the effectiveness of this network enhances the security of the nation.

"The techniques utilized in Ultrafax appear to offer many possibili-

ties in this field, and its perfection will certainly add to the efficiency of the nation's communication system and thus to the national security. My congratulations to the scientists, technicians and members of your organization who have been instrumental in bringing this achievement into being."

Chairman Coy said: "The advance in communications represented by Ultrafax reflects a spirit of research and pioneering of positive benefit to our nation and the world."

Dr. C. E. Kenneth Mees, Vice President and Director of Research of the Eastman Kodak Company, who described the origin of the rapid processing unit used in the demonstration, declared: "We are marking today, with the official unveiling of Ultrafax, the beginning of a new era in communications."

*Future of Ultrafax Discussed*

General Sarnoff described the demonstration as a preview of a new prodigy of television, for Ultrafax is an offspring of that science and art. He said that the number

of uses and the scope of Ultrafax will multiply with time and experience.

"It is now within the compass of one's imagination to foresee the day, when through television and Ultrafax, a radio newspaper may be delivered through the air into every home equipped with a television set," he declared. "It would be possible to have the same transmitter that broadcasts the television program simultaneously broadcast the radio newspaper. In fact, the same home-receiver, with proper attachments, could print the newspaper even without interrupting the program being viewed."

Further, he said, it seems only reasonable to expect, as the present system of Ultrafax progresses, that it may be possible to transmit full-length motion pictures from a single negative in the production studio simultaneously to the screens of thousands of theatres throughout the country. This, he added, would provide a new system of motion picture distribution.

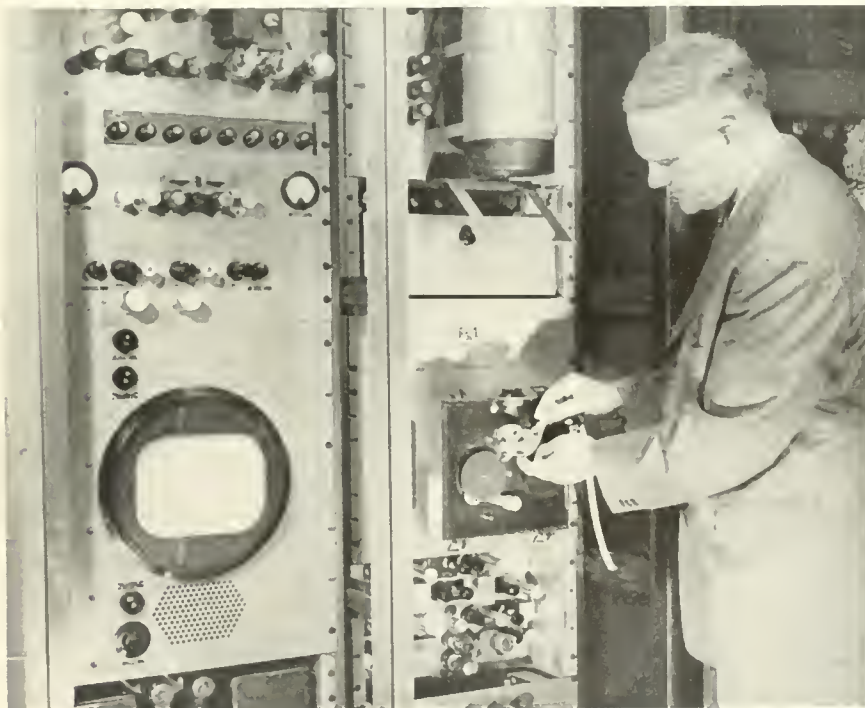
The messages, letters and documents beamed through the air to be received and reproduced as exact duplicates of the originals, General Sarnoff pointed out, revealed that Ultrafax holds promise of a radio mail system.

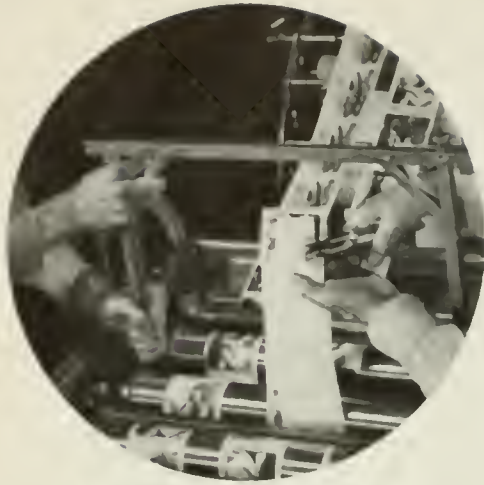
"We would, of course, have to add hands and feet to this winged messenger," he continued, "in order to provide a pickup and delivery service that corresponds to our present mail system. That is where the Post Office with its thousands of letter carriers and mail boxes may find new opportunities for increased service to the public."

As a radio-mail system, it was pointed out, Ultrafax has the potential of delivering the equivalent of forty tons of mail coast-to-coast in a single day at relatively low cost.

General Sarnoff envisaged this new system as a new arm of our national defense. In the busiest days of the war, the Signal Center at the Pentagon Building handled as many as ten million words a day. Ultrafax, he said, could handle this extraordinarily heavy load in ten minutes with one transmitter and in one minute with ten transmitters in operation. Thus, in any future war, should communication centers

RECEIVING TERMINAL OF ULTRAFAX SYSTEM AT WHICH THE INCOMING MESSAGES ARE REPRODUCED AS TELEVISION IMAGES ON A KINESCOPE TUBE IN THE CYLINDER AT UPPER RIGHT, AND THEN COPIED ON FILM BY THE CAMERA DIRECTLY BENEATH THE CYLINDER. HERE C. J. YOUNG OF RCA LABORATORIES IS LOADING THE CAMERA.





CLOSE-UP VIEW OF DRYING UNIT OF THE CONTINUOUS PAPER PROCESSOR. THROUGH THIS EASTMAN DEVELOPMENT, ENLARGED REPRODUCTIONS OF ULTRAFAX MESSAGES CAN BE SPEEDILY HANDLED.

be destroyed by atomic attack, Ultrafax might prove vital in providing facilities to move military intelligence, message traffic, V-mail and other mail across the continent, across the seas, or across the globe with lightning speed and mobility. Such a system, General Sarnoff said, may prove to be "an indispensable element in our national security."

"We can foresee the day," he continued, "when Ultrafax, which includes television and radio relays, can provide us with a new service of international television. But first, an 'airlift' must be provided across the Atlantic. Even now by the use of twelve to fourteen suitably equipped communication planes flying over the ocean and properly spaced, an overseas airborne radio-relay system could be established between the United States and Europe that would provide not only an exchange of television programs, but also handle the equivalent of tons of mail, news and other services which Ultrafax makes possible.

"I cannot conceive any better peacetime use to which some of our military planes on the ground can be put than to provide such a transoceanic radio-relay service. Certainly, the practice and experience, which our Armed Forces would gain in peacetime, would be invaluable in time of crisis.

"How to guide the future of Ultrafax and to translate its poten-

tialities into services," said General Sarnoff, "is the job not only for the scientist and engineer, but also for the industrialist and businessman and for Congress and the Federal Communications Commission. Indeed, so many political and social problems are raised by these and other recent scientific developments that a new national communications policy should be considered and established by Congress. In any consideration of such a comprehensive national policy, the legitimate interests of private industry and of the various Government departments concerned with such activities, as well as the needs of our Armed Forces, must be given the careful study that they deserve."

He said he was merely trying to outline the many possibilities of Ultrafax. "No one," he declared, "knows all the possible answers to the problems which this new art poses. But we must weigh the problems today if we are to find the answers tomorrow."

#### How Ultrafax Operates

Ultrafax's remarkable speed, the engineers explained, is possible be-

cause full pages of information are transmitted as television pictures at the rate of fifteen to thirty a second. The principal steps in transmitting and receiving by Ultrafax are:

1. Preparation of data to be transmitted, to assure a continuous flow at high speed.

2. Scanning of this data by what is known as a flying-spot television scanner, at the sending terminal.

3. Transmission of the television image as ultra-high radio-frequency signals over a microwave relay system.

4. Reception on projection-type television kinescope, or "picture tube", from which incoming messages are recorded on motion picture film, or ultimately directly onto photographic paper.

At the end of a transmission, the exposed film can be transferred quickly to a special processing unit developed by Kodak Research Laboratories. The film is passed through a miniature developing tank, rinsed and fixed in less than 15 seconds and dried in 25 seconds more. This unit, regarded as an

(Continued on page 22)



*My heartiest Congratulations  
to the Scientists and Engineers who have  
created and developed this new System of  
Radio Communications.*

*May Ultrafax, as swift as light,  
open a new and useful service for  
Mankind everywhere.*

*Harry Sarnoff*

FIRST PUBLICLY TRANSMITTED ULTRAFAX MESSAGE—A MESSAGE OF CONGRATULATIONS FROM GENERAL SARNOFF TO THE ENGINEERS WHO HELPED MAKE ULTRAFAX POSSIBLE.





AN NBC TELEVISION CAMERA SCANS THE CROWDED FLIGHT DECK OF THE U.S.S. LEYTE, BEFORE THE SHIP'S FIGHTING PLANES TAKE OFF IN SIMULATED MANEUVERS.



AGAINST A COLORFUL BACKGROUND OF ANTENNAS FOR RADAR AND OTHER SERVICES, A TELEVISION CAMERAMAN TRAINS HIS INSTRUMENT ON ACTIVITIES BELOW.

## Television Presents "Task Force TV"

*In First Telecast of Its Kind, Two Million Video Viewers in Their Homes Watch Thrilling Maneuvers of U.S.S. Leyte as Aircraft Carrier Undergoes Mock Combat Attack at Sea*

**I**N A HIGHLY entertaining and informative 100-minute telecast on August 29, originating aboard the aircraft carrier *U.S.S. Leyte* at sea, the NBC television staff saw the result of five months' preparation reach a successful climax. An estimated 2,000,000 video viewers in the East watched the flat-top, under simulated combat conditions, undergoing a mock attack by its own planes in maneuvers known as "Task Force TV."

Preliminary work on "Task Force TV" began with a visit by NBC's television special events director to the *U.S.S. Kearsage*, an Essex class carrier, to determine the feasibility of such a telecast. Once it was decided that the feat was possible from an engineering standpoint, the Navy cast about for a carrier to be made available to NBC for the long periods needed for tests and for the program itself.



By Doug Rodgers

*Assistant Director, Program Dept.,  
NBC Television*

When the *Leyte* was chosen, a series of visits were made by James Davis, surveying engineer, and myself to complete plans. A tremendous amount of engineering coordination and planning was needed to plot the complicated paths of video and audio signals—video from *Leyte*

to the Empire State Building to Radio City and back to Empire again; audio from *Leyte* to RCA at Riverhead, L. I., to RCA Communications building, New York, to Radio City to Empire. Chance for error naturally increased with each link added and we were fighting shipboard problems all the way.

Circumstances involving the carrier and her orders, together with the mounting cost of producing the show, shortened the scheduled test period from two weeks to four days before the broadcast. Since the transmitter to be used was a new 1300-megacycle unit with a beam antenna designed by NBC's development laboratory specifically for this job, chances for success were even slimmer because of the shorter test period.

On the Thursday before the telecast, two tons of equipment, valued close to \$200,000, and about 8,000

[RADIO AGE 7]

Public Library  
Kansas City, Mo.

FROM HIS LOFTY STATION, AN NBC CAMERAMAN WEARING PROTECTIVE HELMET AND SAFETY BELT SWINGS HIS CAMERA TO PICK UP MANEUVERS OF PLANES "ATTACKING" THE CARRIER.



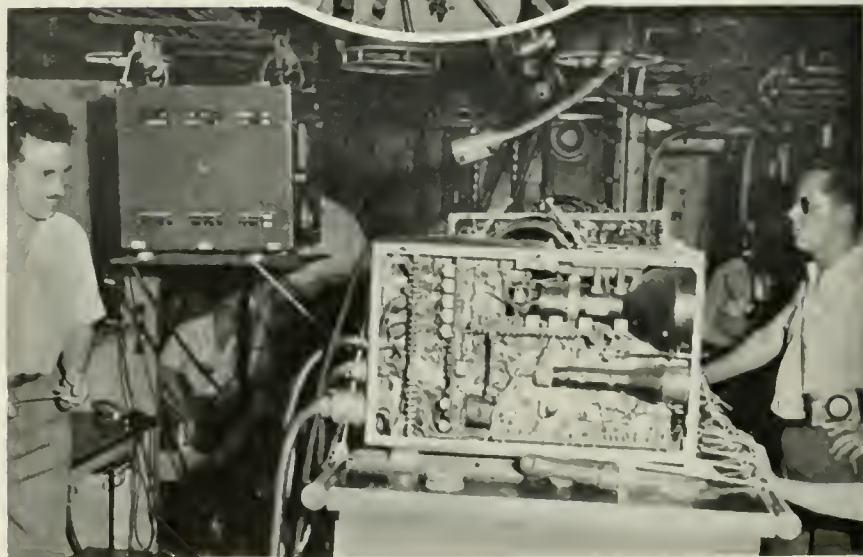
feet of cable were loaded aboard the *Leyte* at Quonset Point, Rhode Island, and the testing began. Meanwhile, details of what was to be televised were decided in conjunction with the Navy. Limiting factors such as the fuel capacity of the aircraft, security regulations, the fact that the *Leyte* could not turn so as to place her mast between her transmitting antenna and Empire State, immovability of cameras, possible weather and wind conditions, etc., were taken into account in planning the show's format.

After the program was planned, the next big problem was to place the cameras where they would catch as much of the action as possible and still provide a means of covering each sector with two cameras in case one failed. These cameras had to be chained because of the pitch and roll of the vessel, and so were immovable during the broadcast. The *Leyte* provided us with excellent platforms for the three above-deck camera positions. One was built in the catwalk opposite the island and next to the deckside plane elevator; one extended from the bridge, and one from the air defense station five levels above the flight deck, and to the rear of the island.

All three of these positions were personally dangerous to cameramen. Bob Long, our elevator side cameraman, wore a life-belt and safety line, and was fenced in by a guard rail. His camera, located at flight deck level, about amidships and with 360 degrees of freedom, was able effectively to see every part of the action as a Navy crewman working there would have seen it. The terrific air blast of the propellers, the danger each crewman faced in the deckload of spinning blades were vividly portrayed on this camera. Effective lens-shots through the barriers to catch the landings, across the deck and upward to the streaming colors at the mast also were available to him.

The second camera, built out

[8 RADIO AGE]



DEEP IN THE SHIP'S INTERIOR, CONTROL ENGINEERS MONITOR THE SCENES RECORDED BY THE SEVERAL CAMERAS AND SELECT THE SEQUENCES TO GO ON THE AIR.

ONE UNIT OF THE TWO TONS OF EQUIPMENT WHICH WAS CARRIED ABOARD THE LEYTE TO MAKE THE UNUSUAL TELEVISION PROGRAM A SUCCESSFUL FEATURE.



from the bridge and in the hands of Bill Waterbury, was able to cover most of the flight deck activity and all action on the bridge of the *Leyte* where Captain Charles Coe, commanding officer, was giving orders. The third camera, under Les Shaw's direction, was in air defense aft and covered all landing operations, supplementing camera 2 on the bridge. A fourth camera in the ready room was used to show pilots being briefed.

Briefing of our own cameramen; Rad Hall, our narrator; and Bob Stanton and Ray Forrest, our announcers—none of whom had ever been aboard a carrier—took several hours. Sequences were set up tentatively and important parts of each operation stressed. This later proved to be time valuably spent, when, as suspected, cameramen found it very difficult to hear my

instructions with approximately 100,000 horse-power loose on the flight deck.

Sunday morning the *Leyte* lay off Ambrose Light, twenty miles from the Empire State Building, while the microwave antenna was being homed and tested. The carrier then proceeded slowly out to 26 miles for further tests of transmission.

#### *A Period of Anxiety*

The transmitter had to be shut down then to prevent overheating and was turned on again at 2:30. From then until 4:00 no acceptable picture was seen at Radio City. Then suddenly word came that we were on the air with the opening spot from top Naval Officials in Washington and New York studios, and that the picture from the carrier was good.

However, our troubles were not over at this point. Two minutes before we were to take the opening shot from the *Leyte* two of our above-deck cameras went out. Thanks to the extremely quick work of Edgar Kahn, our video man, both were back in commission within three minutes. One of these, unfortunately, was practically useless due to interference in the picture. Kahn had an answer for that, too. The ready-room camera was completely dismantled and substituted for the ailing one, a process requiring about half an hour. These were the only difficulties in producing "Task Force TV"!

IN A TELEGRAM TO SECRETARY FORRESTAL, GENERAL SARNOFF CONGRATULATES THE U. S. NAVY FOR ITS COOPERATION IN LEYTE TELECAST AND OFFERS RCA FACILITIES "FOR DEVELOPMENT AND APPLICATION OF SCIENCE TO NATIONAL SECURITY."

## "A Privilege to Participate"

AUGUST 30, 1948

JAMES V FORRESTAL  
SECRETARY OF DEFENSE  
WASHINGTON D.C.

CONGRATULATIONS TO THE U.S. NAVY FOR ITS ENTERPRISE AND SPLENDID SPIRIT OF COOPERATION IN TELECASTING BATTLE MANEUVERS ON THE AIRCRAFT CARRIER U.S.S. LEYTE YESTERDAY OFF LONG ISLAND COAST. FROM TELEVISION VIEWPOINT IT WAS A GREAT SUCCESS. THE STRATEGIC IMPORTANCE OF TELEVISION IN NAVAL, MILITARY AND AIR OPERATIONS IN THIS MODERN AGE WAS DRAMATICALLY REVEALED. IT WAS A PRIVILEGE FOR RADIO CORPORATION OF AMERICA AND NATIONAL BROADCASTING COMPANY TO PARTICIPATE WITH THE NAVY IN THIS HISTORIC DEMONSTRATION. OUR FACILITIES IN RESEARCH, ENGINEERING, COMMUNICATIONS AND ALL PHASES OF RADIO ARE ALWAYS AVAILABLE FOR DEVELOPMENT AND APPLICATION OF SCIENCE TO NATIONAL SECURITY.

DAVID SARNOFF  
PRESIDENT AND  
CHAIRMAN OF THE BOARD  
RADIO CORPORATION OF AMERICA

## Elected Director of RCA

George L. Harrison, Chairman of the Board of the New York Life Insurance Company, has been elected a member of the Board of Directors of Radio Corporation of America, Brig. Gen. David Sarnoff, President and Chairman of the Board, announced following a meeting of the Board on August 6. His election fills the vacancy created in July by the retirement of Bertram Cutler as a director of RCA.

Mr. Harrison also was elected to the Boards of Directors of RCA's wholly-owned subsidiaries, the National Broadcasting Company and RCA Communications, Inc.



GEORGE L. HARRISON

[RADIO AGE 9]



GENERAL DWIGHT D. EISENHOWER, PRESIDENT OF COLUMBIA UNIVERSITY (SECOND FROM LEFT), RECEIVES THE HONORARY DEGREE OF DOCTOR OF HUMANE LETTERS FROM DR. LOUIS FINKELSTEIN, PRESIDENT OF THE JEWISH THEOLOGICAL SEMINARY. BRIG. GENERAL DAVID SARNOFF, NEXT TO GENERAL EISENHOWER, AND FORMER GOVERNOR HERBERT H. LEHMAN PARTICIPATED IN THE CEREMONY.

## Sarnoff Speaks at Eisenhower Ceremony

*RCA President, in Address Honoring New President of Columbia University, Declares World Crisis Calls for Inspired Leadership*

*Address by Brig. General David Sarnoff, President and Chairman of the Board, Radio Corporation of America, at Convocation Ceremony held at Jewish Theological Seminary, welcoming General Dwight D. Eisenhower, new President of Columbia University, to Morningside Heights.*

AS one who has had the honor to serve abroad under the command of Dwight D. Eisenhower, General of the Army, I am grateful for the opportunity to join in this welcome to an eminent American—our neighbor on Morningside Heights.

I see more than a gracious act of neighborliness in this occasion. This is a convocation of the students, faculty, and Board of Directors of the Jewish Theological Seminary, to greet their friend and neighbor, the new President of Columbia University, who has chosen to devote his great gifts of leadership to the task of peacetime education. But this also is a convocation of the spirit which expresses the most exalted Americanism.

Great was General Eisenhower's role as Supreme Commander of the Allied Expeditionary Forces when they broke the terror of the German onslaught. Equally great and urgent is the task that now faces him. Civilization, it has been remarked, has become a race between education and catastrophe. In this conflict the principles of true education are arrayed against the false philosophies which seek to undermine the basic values of our civilization. Today, this conflict is reaching a climax. The crisis calls for inspired leadership.

Every page of the General's career bespeaks statesmanship, tolerance and humaneness. He is a soldier of intellectual integrity, with a love for peace and for his fellow man. That Americans everywhere recognize these outstanding attributes of leadership in General Eisenhower has been attested by the national outpouring of respect and admiration, of loyalty and affection for him.

General Eisenhower has seen how technological power can be harnessed to achieve victory in war.

He knows, too, that Science can be an even greater force in the preservation of peace.

We are only at the beginning of the application of scientific methods to our social and political problems, but too many tired intellectuals are ready to give up the search! They begin and end with the thought that though science may teach us the best means for achieving our ends, it cannot tell us what ends to pursue. They fail to take into account the religious and educational forces that shape our lives, and the extent to which ignorance, prejudice and poverty darken men's understanding.

If the historian, Tacitus, could see our world today, he would repeat with the same irony the observation he made more than eighteen hundred years ago: "They create a waste—and call it peace." Through all the centuries of evolving civilization, the problems of man's relationships with man remain essentially the same. We think today that we have a much greater understanding of these problems. But we have still to win freedom

[10 RADIO AGE]

from hate, freedom from prejudice, freedom from superstition, and freedom from ignorance, before we can boast that we have achieved the ideals of a true civilization. Much still must be done to put aright an ailing world.

If the world is to have peace, if civilization is to survive, the mind and spirit must be united to harness the forces of nature for the welfare of humanity. Man must be master of himself, as well as of science. He must guide and control the modern machine, with a superior and unselfish leadership that seeks to serve the needs of modern society.

When science blasts a hole in the iron curtain that hides nature's secrets, it often leaves the wreckage of belief that causes men to lose their bearings in this complex world. There are always timid intellects who, because they cannot put the pieces of their faith together, find no purpose or meaning in life.

There is no denying the effect upon human imagination when vast forces are released by our new discoveries, to present a physical world in endless motion—going relentlessly somewhere, for no perceptible reason, to no understandable destination; a world seemingly oblivious to man. There is no mistaking the paralysis of will and purpose which has seized so many who have lost their faith in an ordered universe. They see man destined to obliterate himself, with the energy he has liberated by exploding the atom.

#### *Task Far From Hopeless*

It is natural that those who have lost faith in man should lose faith in a purposeful world, in a meaningful life. Yet the task of education is far from hopeless. Look at the record of our youth in the last war, or better still: ask General Eisenhower. He will tell you that their heroic performance offered convincing proof of their innate convictions of truth and faith.

On the other hand, it was to be expected that many should be blinded by the false social and political forces which a long era of violence unloosed upon the world. It is the natural backwash of such

a conflict. Some of the disillusioned have dropped what they termed the Great Illusion about God and Country, only to adopt the minor illusion that they can obtain bread without earning it, have freedom without maintaining it, enjoy a right without defending it, and achieve happiness without deserving it. For these cynical slackers in the battle of life, the career of General Eisenhower provides a convincing answer.

#### *Had World-wide Influence*

Columbia University had a world-wide influence under the presidency of Dr. Nicholas Murray Butler. Now another great figure has taken up the torch. General Eisenhower's great gifts as a man of action as well as a man of thought, will contribute much of practical wisdom to the solution of our pressing educational problems.

No man could have entered the educational world with a greater knowledge of so many minds, so many peoples, so many arts, as has

General Eisenhower. To obtain effective cooperation in the war, among millions of men and women of diverse training and background, was an achievement unparalleled in history. General Eisenhower's deeds emphasize, what this Seminary teaches, the virtues which are common to all good men. Let us, therefore, join with him in unifying these social forces, rather than to dwell upon the minor differences which cause misunderstandings and divide people.

To you, as students in these halls of education and religion, I would add that you will find here opportunities of great promise to spread the gospel of service and fellowship. In your search for knowledge and wisdom in a world of crisis and conflict, may you nourish within you the seeds of an inspired spiritual leadership. May the lessons of your abiding faith help man to master the forces he has unleashed, rather than be mastered by them, and thus keep bright the beacons of freedom.

## Mobile Television Projector Provides Life-Size Pictures

Life-size television pictures are now available for hotels, clubs,



COMPACTNESS AND SIMPLICITY MAKE THE PROJECTOR IDEAL FOR CHURCHES, SCHOOLS AND HOSPITALS.

and amusement places, hospitals, churches, schools, and industry through the use of a new, mobile large-screen television projector recently developed by RCA.

The new unit will project a clear 63-square-foot picture at a distance of 17 feet from the viewing screen, and a correspondingly smaller picture at shorter distances. Accompanying sound is supplied by a large speaker housed in a matched cabinet designed for mounting near the screen. Rear projection on a translucent screen, as well as conventional projection on a reflective-surfaced screen, is feasible with this system.

Extremely simple operation is a feature of the new projector. The controls, operated as easily as those of a home television set, are arranged to permit adjustment without blocking the path of the projected picture. An "all channel" station selector permits instant selection of the station desired.

# More Channels for Television

*Appearing at FCC Hearing, Engstrom of RCA, Outlines Current High-Band Tests in Washington and Reaffirms Company's Cooperation with Government and Industry*

**D**ISCUSSING the challenge of what he described as television's "phenomenal rise", Elmer W. Engstrom, representing the Radio Corporation of America and the National Broadcasting Company, at a hearing on September 21 before the FCC, outlined several considerations in the orderly development and extension of present commercial television service.

Mr. Engstrom, Vice President in Charge of Research of RCA Laboratories, declared that in the three years since the Commission's 1945 Allocations Decision, television had "caught the enthusiasm of the public, the broadcaster, the advertiser and the entertainment world."

He said that the public, as of June 30, had invested \$228,000,000 in television receivers, being produced at that time at the rate of 65,000 a month by more than fifty competing manufacturers. The number of television stations on the air has jumped from six to thirty-one as of the same date, he added, and permission has been granted for construction of seventy-eight additional stations, while 285 applications are pending. Of this total of 394 stations, 5 are owned and operated by the NBC.

## *Factors in Television Progress*

This rapid progress of television resulted from a number of factors, Mr. Engstrom asserted. He listed these as follows: First, the Commission's decisions on standards and allocations which provided a stable basis for planning; second, the manner in which the radio industry expedited conversion to peacetime manufacturing, and took the maximum advantage of wartime developments; third, vision and courage of broadcasters which prompted them to go ahead, in the face of monetary losses, during the pioneering years of operations, and with faith in the future of television as a service to the public.

"Commercial television service

is today a reality, and this reality has been built upon the bedrock of the twelve channels allocated to television by the Commission," affirmed Mr. Engstrom. "In our opinion, the further development and expansion of television must continue to be built upon the basis of these twelve channels.

"RCA-NBC agree with the Commission that more channels are necessary for commercial television. It is our desire that as many people as possible in the United States have an opportunity to receive television service. We are willing and anxious to work with the Commission and the industry to advance this objective as rapidly as possible. In so doing, there are several possible avenues of approach.

## *Higher Power Urged*

"RCA-NBC feel that the Commission should authorize the use of higher power for television stations. We feel that it is only by the use of higher power that improved reception can be provided for the public throughout the service area of a television station. This higher power would make possible the simplification of the receiving antennas and the installation of television receivers. . ."

A second possibility for expansion consists in the assignment of additional channels for television below 300 megacycles. Accordingly, Mr. Engstrom urged the Commission to examine thoroughly the allocations below 300 megacycles to determine whether some additional channels could be made available there for television.

Mr. Engstrom suggested further that the Commission should continue to explore the characteristics of the band 475 to 890 megacycles to determine whether it is feasible also to assign space there for the expansion of television.

In reference to his statement on the RCA-NBC position on the

question of introducing television to the upper frequencies, Mr. Engstrom said:

"We feel that any plans for commercial use of the uhf band should provide for the use of the same standards, insofar as they relate to interchangeability of operations as those in use on the present twelve channels. While, of course, the opening of these higher frequencies to commercial service would not immediately produce an answer to the problems which the industry and the Commission face, it would serve to stimulate the commercial development of equipment and shorten the time until the problems of this region would be solved."

Recalling that for many years RCA has carried on research in the upper reaches of the radio spectrum, Mr. Engstrom declared that allocations by the Commission of frequencies above 475 megacycles for the future use of television and research with respect to color television had stimulated RCA study of this area of the spectrum. He pointed out, for instance, that RCA had begun propagation tests in Washington earlier this month.

## *Tests Being Made in Capital*

"With the announcement of this hearing," he said, "our plans were altered and it was decided to shift some of the propagation tests from New York to Washington. By expediting the work of installation we were able to get on the air with transmissions at a date prior to the beginning of these hearings. The present transmissions will be continued for a suitable period of time in order to permit persons who so desire to make investigations, and in particular, to give the Commission ample opportunity to make such studies as it requires."

In conclusion, Mr. Engstrom declared: "We are here to help the Commission by supplying data in the testimony which follows and to develop any points which the Commission may regard as relevant. Just as crystallization of standards and allocation of channels a few years ago resulted in today's television industry and service, an

*(Continued on page 32)*



SCENE IN STUDIO 8H ON ELECTION NIGHT IN 1944. ACTIVITIES IN THE SAME STUDIO WILL BE INTENSIFIED THIS YEAR BY THE PRESENCE OF SEVERAL TELEVISION CAMERAS.

## TELEVISION JOINS RADIO COVERING ELECTION RETURNS

*For the First Time, Both Network Services, Operating Simultaneously, Are to Carry Results of Presidential Contest*



By William F. Brooks

*Vice President in Charge of News and International Relations  
National Broadcasting Company*

WHEN millions of Americans go to the polls next month to choose the 33rd president of the United States, it will mark the first time that the National Broadcasting Company has broadcast and telecast simultaneously over networks the up-to-the-minute bulletins of election returns and summations of balloting trends.

An augmented staff of over 300, comprising announcers, commentators, rewrite men, tabulators, editors, engineers, cameramen and technicians will be assembled to handle the heavy volume of election news that will be pouring into the NBC newsroom over a battery of teletypes. These machines will sup-

ply election returns compiled by the Associated Press, United Press, and International News Service.

In addition to the announcement of election returns, both radio and television networks will carry on-the-spot features from major party headquarters in New York and Washington, local color pick-ups at the homes of the presidential and vice presidential candidates, interviews with the national chairmen of the major parties and coverage of other points of interest, including the surging crowds.

To provide the maximum amount of air time for the election coverage, commercial program schedules are being adjusted in cooperation with sponsors who, in events of similar importance, have been eager to assist in this public service. It is expected that the election features will start at 8 p.m. EST., with both networks remaining on the air until the outcome of the election is certain. As a final offering, NBC commentators will pool their observations in a special round-table discussion program after the returns are in and victory has been conceded.

Headquarters for NBC's coverage will center in studio 8H, Radio City, the world's largest broadcasting studio. Following in general,

the layout which proved so successful in 1944, the studio will be transformed into a special news center. At the rear of the stage a huge election chart showing the latest assembled returns will be erected. Directly below the chart, will be a battery of news tickers, a control desk, copy table, tabulators, monitoring tables, and press desks.

On an elevated dais, facing the entire setup, will be the radio commentators' table. H. V. Kaltenborn and Robert Trout will act as chief commentators for the radio operation. The television section, from which cameras will play upon the giant election chart as well as the proceedings on the floor of the studio, will occupy the other side of the huge auditorium. Ben Grauer and John Cameron Swayzee will act as chief commentators for the television network.

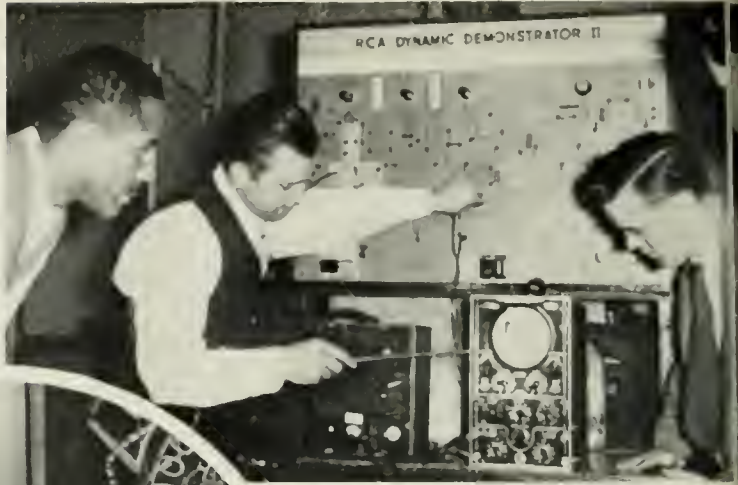
Television stations linked with WNBT, New York, in the NBC network will be, WPTZ, Philadelphia; WTVR, Richmond; WNBW, Washington; WRGB, Schenectady; WBAL, Baltimore; and WBZ, Boston. Midwestern television audiences will witness special election coverage over NBC's newly formed midwestern television network.

LEADING COMMENTATORS AND NEWS-CASTERS WILL BE TELEVISIONED AS THEY ANALYZE THE VOTING TREND ON THE NIGHT OF NOVEMBER 2.



Proficiency in International code is a necessity for students interested in radio communications.

Use of test instruments in servicing electronic equipment is explained with the aid of a demonstration board.

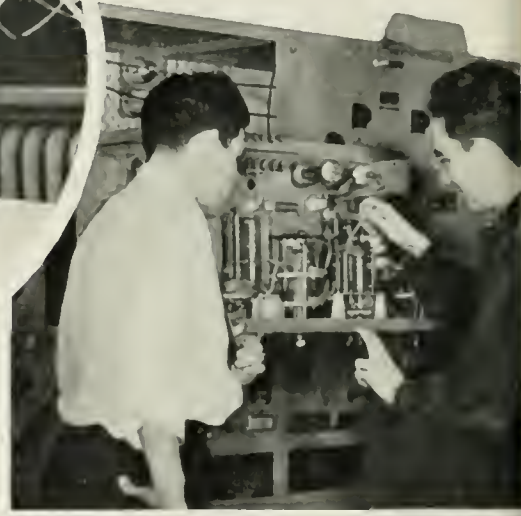


An Institutes group learns modern methods of servicing radio receivers and other electronic apparatus.

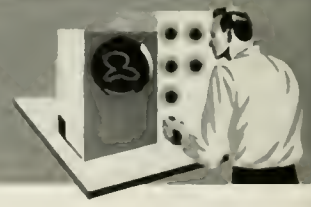
A thorough knowledge of radio transmitters is gained by experiments in the laboratory.



A student studies the design and operation of machines for generating power.

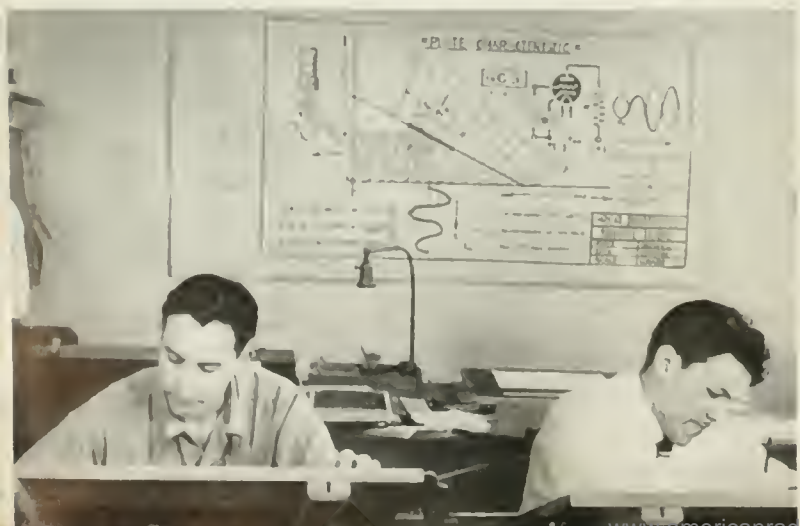


# TRAINING TECHNICIANS AT RCA INSTITUTES



The making and reading of blueprints are essential parts of the instruction in the Advanced Technology Course.

Potential laboratory technicians and radio station engineers attend a lecture on radio circuits.







FRANK M. FOLSOM, EXECUTIVE VICE PRESIDENT IN CHARGE OF THE RCA VICTOR DIVISION (LEFT) AND CHARLES A. DOSTAL, VICE PRESIDENT, WESTINGHOUSE ELECTRIC CORPORATION, AT APPLIANCE TRADE DINNER IN SAN FRANCISCO.

## TELEVISION HEADS WEST

*San Francisco will be Test Point for Video Because of Problems Raised by Mountainous Region, Folsom Tells Trade Association.*

TELEVISION, having proved itself in the East by its wide variety of entertainment and its up-to-the-minute coverage of major sports, political conventions, and news events, now faces toward the West, according to Frank M. Folsom, Executive Vice President in Charge of the RCA Victor Division.

Speaking at the Western Radio and Appliance Trade Dinner in San Francisco, on August 1, Mr. Folsom told retailers and distributors that "the entire nation will be watching the progress of television in San Francisco with close attention." because through experience gained in that city, he said, the industry will learn much about the ability of the service to operate in a mountainous region, and from the tests made there many interesting new developments should result.

In reviewing television prospects in the Golden Gate city, Mr. Folsom said:

"Three stations already have been granted construction permits in San Francisco. One will be owned by the American Broadcasting Company, another by Associ-

ated Broadcasters, Inc., and the third by the San Francisco Chronicle, to be affiliated with NBC."

With only six channels available to the San Francisco-Oakland region, he pointed out, six broadcasters are seeking the remaining three unassigned channels. These are: Twentieth Century-Fox of California, Inc., Paramount Television Productions, Inc., the Columbia Broadcasting System, Don Lee Broadcasting Company, Television California, and station KROW, in Oakland.

Sizeable sums are being invested in television by broadcasters seeking outlets on the West Coast, said Mr. Folsom. Construction figures range as high as \$691,785, with one applicant planning to spend \$921,693 for his first year's operation.

Plans are well along, he said, for linking San Francisco by cable and relays with all major cities to the North, the East and the South. Although coast-to-coast networks are not expected to be in operation until the end of 1952, Folsom said, regional links will supply interconnecting television service for West

Coast municipal neighbors at a much earlier date. Then, with the West and the East linked by networks, national advertisers, no longer restricted to locally originated programs or shows recorded on film, will be able to present television programs using talent that would be far too costly for individual station showings.

In emphasizing the importance of video's future role as an advertising medium, the RCA executive quoted Amos Parrish, noted merchandising consultant:

"Television is the biggest thing since radio. And it will out-sell radio in selling goods many to one, because it appeals to your eyes as well as to your ears. And the eyes are still the windows to your soul — especially your buying soul.

"We don't know and we don't want to know what's in a television set, because we don't understand it. But we do know there is one thing —one of the elements that makes up the future of America—and that means it has no limits. That no-limit element is a combination of excellent reporting, teaching, entertaining, selling. This element says in undebatable terms: 'Stop, Listen and LOOK!' And people will not only 'Stop, Listen, and LOOK!'—but they will also buy."

Television receivers are rolling off production lines in an increasing spiral, Mr. Folsom revealed. Today more than 500,000 are in the public's hands. By the end of the year, he predicted, the industry should have produced in excess of 850,000 television receivers. In 1949, the estimated output should be 1,600,000 receivers, representing a potential retail business of more than \$400,000,000. As its share of this figure, Mr. Folsom said, San Francisco can expect a television receiver business with a retail volume of more than \$10,000,000.

"Proud as we are of the business stature television has attained," he said in conclusion. "we're even prouder of the many excellent ways in which it has served and will continue to serve humanity with major roles envisioned for it in educational, religious, industrial and military fields."



1. An installation crew receives orders from the dispatcher at an RCA Service Company office, the first step in servicing a new television receiver.



4. When the truck arrives at the customer's house, the RCA dipole receiving antenna is assembled on the ground before being erected on the roof.



2. The two-man RCA installation crew checks equipment before leaving the service depot in the completely equipped truck.



5. Using special rigging and supports, the antenna is clamped securely to the most suitable spot on the roof.



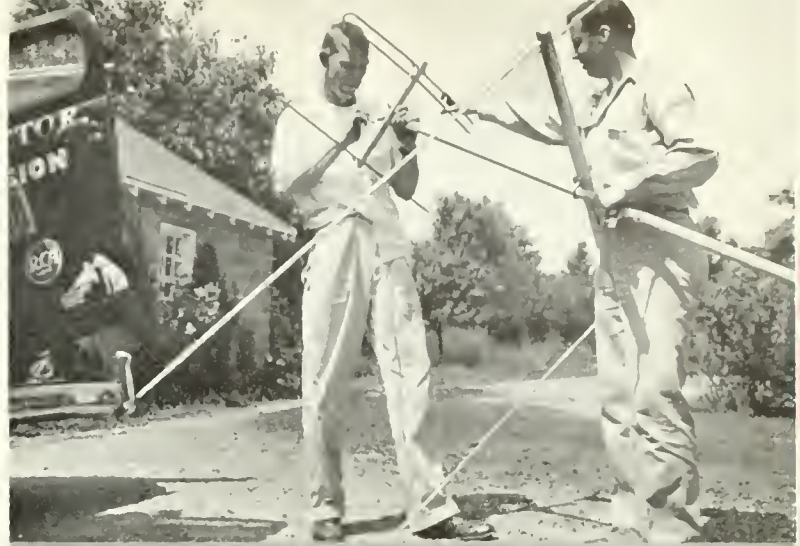
3. Credentials of the RCA service crew are presented to the new owner of a television set before starting work on the television installation.



6. Holes are drilled in the side of the house to support hooks for the RCA "Bright-picture" tape which conveys signals to the receiver.

# RCA Television Servicemen at Work

In many cities and towns from coast to coast, RCA Service Company technicians are installing RCA Victor television receivers at a constantly increasing rate. The pictures on this page, taken by Don Reed and Nick Strinkowski of the Bryn Mawr, Pa., service depot, portray some of the important steps in the daily routine of a television service crew.



9. A high frequency antenna is added to the main antenna mast to ensure reception of all stations in localities where some signals are weak.



7. A 10-inch RCA kinescope is inserted into the socket of the television receiver to complete the installation inside the home.



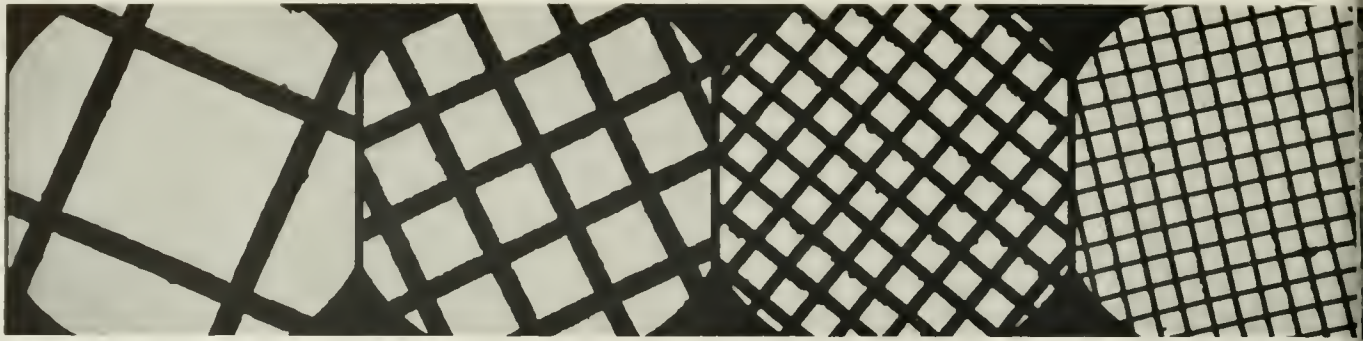
10. Before leaving the installation, an RCA Service Company crewman explains the operation of the receiver to the woman-of-the-house.



8. One RCA technician observes results as the antenna is oriented and gives orders to the other crew member when the best picture is obtained



11. Television receivers requiring complicated repairs or adjustments are brought to the RCA service shop where the most modern equipment is available.



SHADOW PICTURES OF 200, 500, 1000, AND 1500 MESH SCREENS ENLARGED 200 TIMES BY ELECTRON MICROSCOPE.

## MAKING FINE MESH SCREENS

*Metallic Gossamers of Extreme Fineness Are Made for Image Orthicon Tubes by Process Developed at RCA Laboratories*



By Dr. Harold B. Law  
RCA Laboratories Division

PRODUCTION of a copper screen with 250,000 openings to the square inch was one of the problems faced in developing the sensitive image orthicon television camera tube now in common use at most television studios. Because the electron image of the scene to be televised is focused on this screen, the mesh must be extremely fine, otherwise it would be visible in the picture when viewed at the receiver.

Despite formidable difficulties, the problem was not only solved but in the research a method of manufacture was devised by which a screen could be made with the holes constituting more than 50 percent of the screen area.

The finest prewar mesh screens were made of woven wire or formed

by electrolysis. They had about 200 holes per linear inch, or 40,000 openings to the square inch. However, these metallic gossamers passed less than 40 percent of the electron image and, in addition, were non-uniform in the arrangement of openings.

Although these were the screens that had to be used in early models of the image orthicon, it was immediately obvious that they would seriously restrict picture quality.

Because of the possible value of the image orthicon in military applications, a search was started for a method of making a high transmission, uniform screen of 500 mesh or more. Out of this war-intensified activity came a procedure that, on a small scale, delivered very uniform screens up to 1500 mesh, three times the goal.

On the opposite page is an attempt to illustrate the fineness of a 500-mesh screen. A small section of screen was laid over a period of the size which ends this sentence and the combination was enlarged about 70 times. Small as the dot appears to the naked eye, nevertheless, the photomicrograph reveals that 66 perfectly-formed, complete openings of the screen are included within the circumference of the period.

Production of fine mesh screens by the process developed at RCA Laboratories really begins with a sheet of highly polished plate glass

coated with a layer of material resistant to acid. An exceedingly accurate ruling engine, similar to those used in making optical gratings, scores the desired pattern through the resistant layer, and then the lines are etched into the glass by submersing the entire plate in a hydrofluoric acid.

The metal which will form the screen is applied to the master by a process called sputtering. In this, the master is exposed to a fine mist of a special palladium-gold preparation until a thin semi-transparent layer of the metal covers the surface of the glass. The master is then placed in a shallow dish of water while the surface is rubbed with a thin piece of rubber. This removes the thin metal on the surface, without affecting the metal in the grooves. A corner is left unrubbed in order to provide electrical contact for the next step, that of copper-plating the metal in the grooves.

Since the metal in the grooves is

SECTION OF 200-MESH GLASS "MASTER", ENLARGED ABOUT 400 TIMES.



[18 RADIO AGE]

EXCESS METAL IS ERASED FROM THE MASTER (LEFT) AS ANOTHER WORKER EXAMINES A SCREEN FOR FLAWS.



very thin, plating does not take place instantly over the whole surface but proceeds from the plating electrode in an ever-widening area until the whole surface is covered.

After plating, the master with the screen in the grooves is washed and the screen removed. Depending on the master, the screen may "float" off in the wash water or require only gentle pulling to be freed from the grooves. Roughness of the etch producing the grooves

FINENESS OF 500-MESH SCREEN IS ILLUSTRATED BELOW BY LAYING A SECTION OVER A PERIOD AND ENLARGING THE COMBINATION 70 TIMES.



largely determines the degree to which the screen sticks.

High transmission, fine mesh screens are, of necessity, very delicate. To secure a screen mounted tautly on a frame is a difficult task if conventional mounting procedures are used. Fortunately in this instance, nature was caught in one of her rare cooperative moods, for it was soon found possible to mount the screen in a safely loose condition, using ordinary methods. Then, by holding the mounted screen for a few minutes in a vacuum in a temperature of about 900° C., it was found that a contraction takes place that tightens the screen ready for use.

With the start of factory production of the image orthicon the need for relatively large production of fine mesh screen became apparent. Mr. R. S. Moore, RCA Victor Division, Lancaster, Penna., took over the problem and has contributed improvements in the process. These advances result in a longer master life and a continuous high quality output in great numbers of 200 and 500 mesh screens of 75% and 60% transmission respectively, and in lesser quantities of 1000 mesh.

## NBC Television Newsreel Moves to New Quarters

New quarters for the NBC Television Newsreel will be opened early next month in the RKO-Pathé Studios at 106th Street and Fifth Avenue, New York City.

In announcing the opening, Sidney N. Strotz, administrative vice president in charge of NBC Television, said that the entire job of editing, processing and storing the films is to be performed in the new studios. In addition to the space for film work, facilities available in the new studios include three live video studios and an entire floor for office personnel. The main live studio measures 97 by 74 feet.

The move of the newsreel was timed, according to Strotz, to coincide with completion of the reel's reorganization by Jerry Fairbanks Productions.

After "moving day," the newsreel will be integrated within NBC's news operations.

NBC now produces and broadcasts three newsreels weekly in addition to numerous special event and documentary films and a weekly ten-minute review of the news.

## 25-Year Employees Receive Gold Watches

TEN employees of the RCA Executive Offices who have served twenty-five years or more with the Company were awarded gold watches at a luncheon held September 17 in Radio City. Presentations were made by Edward J. Nally, first president of the Radio Corporation of America and at present a member of the RCA Board of Directors. Brigadier General David Sarnoff, President and Chairman of the Board of RCA addressed the group following the presentations.

Those receiving the awards were George S. De Sousa, Vice President; Henry A. Sullivan, Controller; William R. Eberle, Robert C. Hoek, George H. Clark, Mary Millea, Clara A. Schlevogt, Eleanor F. Wetzel, Ella V. Smith and Alice Wishart. Marie A. Ward and Mary E. Casserly were eligible for awards but were unable to attend.

[RADIO AGE 19]



LEFT: RADAR ANTENNA OF THE "MORAN" IS LOCATED AT PEAK OF FOREMAST.

BELOW: CHIEF MATE F. C. SCHWEIGEL OPERATES THE RADIOMARINE RADAR AS FRANK BELFORD, VICE PRESIDENT OF THE MORAN TOWING COMPANY, (CENTER) AND SALES ENGINEER R. E. SCANLAN OF RADIOMARINE WATCH THE PROCEDURE.



## TUGBOAT RADAR

*Radiomarine Unit Aboard the Edmond J. Moran Speeds Passage of Tows Through River and Harbor Channels*

**T**ORTUOUS river channels, numerous bridge abutments, tricky tides and a confusion of harbor shipping, once formidable obstacles faced in fog and darkness by the skipper of the tugboat *Edmond J. Moran* while hauling barge loads of chemical refuse from Sayreville, N. J., to ocean dumping grounds well off the Jersey coast, are scarcely more than normal navigating problems since the installation of Radiomarine radar equipment aboard the *Moran*. With the radar scope revealing the position of every detail of the channels and the landmarks bordering them, the

skipper is able to follow his course in all weather as confidently as though he had daylight as his ally.

The route followed by the *Edmond J. Moran*, a 1900 h.p. diesel-electric tug, leader of Moran's deep-sea fleet, gives the radar unit a constant opportunity to prove its value. Starting at the plant of the National Lead Company on the Raritan River near Sayreville, the tug picks up a 260-foot specially constructed barge loaded with 300 tons of chemical waste. The river channel that must be followed averages only 270 feet in width with clearances between bridge abut-

ments of less than 150 feet, leaving little margin for error. Once beyond the river mouth the tow heads out into Raritan Bay, through Sandy Hook and South Channels to Scotland Lightship, then 13 miles to the designated dumping area.

The total distance of the haul is 33½ miles, most of it through waters that require at all times a constant watch of anchored and moving vessels, buoys, markers and shifting currents. Unaided by radar, the progress of the tow in fog and at night was often slow and precarious, thereby adding to the 13 hours normally required for each round trip.

"The course followed by the *Moran*," said Frank Belford, vice president of the Moran Towing Company, "is a severe test of the value of radar as a navigational aid. The Radiomarine unit is doing

a fine job and is proving its effectiveness."

Commenting on the performance of radar aboard his tug, Chief Mate Fred C. Schweigel said: "Radar is an aid when navigating approaches to the Victory, Addison and Pennsylvania R.R. bridges in the Raritan River through narrow channels. It is also helpful when crossing the European and Southern route steamship lanes and when making the hazardous entrance to the narrow channel at Sandy Hook, beset by terrific sets of tides. Radar helps us watch the buoys and keep in the narrow channel."

For all its proved effectiveness, the 3.2-centimeter Radiomarine radar is neither massive nor difficult to operate. A complete installation consists of only three units, two of which are usually placed in the wheelhouse. The third unit, the griddle-like antenna is mounted atop one of the ship's masts.

The indicating unit contains the 12-inch radar scope and is located alongside the wheel where it can be easily viewed. As navigating conditions change, the details made available on the scope may be changed to conform. By the simple twist of a knob, the scope picture may be altered instantly to cover a range of 1½, 5, 15 or 50 miles. Objects as close as 80 yards are discernible on the 1½ mile range.

A complete picture of the range under view is obtained by the revolving radar antenna. By means of an electronic switching system, this antenna sends out a brief radio pulse of extremely short duration and an instant later acts as a receiving antenna to pick up the returning "echo" of that pulse. These pulses, returning many thousands of times a second from any and all obstacles encountered, are coordinated on the scope and re-create the radar view of the area.

where, from 1930 to 1942, many of the components of the present television system were developed under his direction. These included the first high-power, high-frequency television transmitter, the first iconoscope camera, the first remote pick-up and radio relay.

Since 1942 he has been directing television research at the RCA Laboratories, Princeton, N. J. The all-electronic simultaneous color television system is one of the latest results of this work. In 1940 he received a Modern Pioneer Award from the National Association of Manufacturers, and in 1947 a Fellowship Award in the Institute of Radio Engineers. Both awards were for his contributions to television.

The Institute's 1948 Levy Medal was awarded to Dr. Rajehman and Cherry, research physicists at the Laboratories, in recognition of their paper "The Electron Mechanics of Induction Acceleration," which appeared in the April and May, 1947, issues of the Journal of The Franklin Institute.

Dr. Rajehman was born in London, England, in 1911. He received his diploma in Electrical Engineering in 1934 and the degree of Doctor of Technical Sciences in 1938 from the Swiss Federal Institute of Technology. In 1936 he joined the staff of the RCA Manufacturing Company as a research engineer and in 1942 was transferred to the RCA Laboratories in Princeton as a research physicist. He has been chiefly responsible for the development of the electron multiplier. He is a member of Sigma Xi, American Physical Society, and Institute of Radio Engineers.

Cherry is a graduate of the Massachusetts Institute of Technology, where he received his degree of Bachelor of Science in physics in 1941. In August of the same year he joined the RCA Manufacturing Company in Harrison, New Jersey, and in 1942 he was transferred as a research physicist to the RCA Laboratories at Princeton. At present, Cherry is working in the RCA television group and carrying on graduate studies in physics at Princeton University. He is a member of Sigma Xi.



RAY D. KELL

WILLIAM H. CHERRY

DR. JAN A. RAJCHMAN

## THREE SCIENTISTS HONORED

*RCA Laboratories Staff Members Receive Awards from The Franklin Institute*

**M**EDALS for their contributions to the field of electronics were awarded Ray D. Kell, Dr. Jan A. Rajchman, and William H. Cherry of RCA Laboratories, Princeton, N. J., by The Franklin Institute, at Medal Day ceremonies in Philadelphia, on October 20.

Kell, director of television research, received the Stuart Ballantine Medal for "his outstanding pioneer work in television, the adap-

tation of this means of communication to military needs, and for his inventive contributions and leadership in the development of color television."

Kell was graduated from the University of Illinois in 1926, with a B.S. degree. Following three years of association with the General Electric Company at Schenectady, N. Y., he joined the RCA Victor Division of RCA at Camden, N. J.,

# Ultrafax Demonstrated

(Continued from page 6)

important advance in photographic art, resulted from advance equipment built for the armed services during the war.

The Ultrafax film may be enlarged to full-sized copy by means of a high-speed continuous processing machine. The equipment is similar to that used during the war for V-Mail enlarging. There is no limit to the number of Ultrafax messages which may be printed from a single film.

Elmer W. Engstrom, Vice President in charge of research at RCA Laboratories, pointed out the significance of the Ultrafax demonstration with respect to the construction at this time of nation-wide radio-relay networks which are capable of transmitting interchangeably both television and Ultrafax signals. Mr. Engstrom stated: "We have succeeded in obtaining results which show that Ultrafax can now promise practical commercial use, and at a time when demands are greater than ever for speed, speed and more speed in communications."

The advanced engineering and development work is under the direction of Donald S. Bond of the RCA Laboratories staff, who participated in the demonstration. Mr. Bond has spearheaded the task of putting together the known tools as developed for television, radio relays and facsimile, all of which have been combined as a system to create Ultrafax. With associates in RCA Laboratories and NBC, Mr. Bond devised the electronic equipment, and in cooperation with engineers of Eastman Kodak Company, added high-speed film processing apparatus. Credit for contributing early suggestions as to how Ultrafax could employ radio-relay and television techniques is given to C. W. Hansell of RCA Laboratories, pioneer in developing radio-relaying systems.

## Historic Documents Transmitted

The Library of Congress and other government agencies provided material transmitted during the proceedings, which lasted more than an hour. Among the documents sent and received by Ultrafax to demonstrate its versatility were:



ULTRAFAX CAN TRANSMIT ENTIRE BOOKS, EVEN AS LONG AS "GONE WITH THE WIND", IN A FEW SECONDS.

A battle map, contour map, and four pages of Naval specifications—as examples of national security and military uses.

A transportation schedule, bank draft, financial report, technical drawing, money order—as examples of usefulness to business and industry.

Personal letter with diagrammed drawing, birth announcement—in the new father's excited handwriting.

FBI description of a public enemy-at-large, along with fingerprints; weather map; Civil Service job application; consumer price index chart—illustrating Ultrafax's public service potential.

Newspaper mastheads, cartoons, advertising layout and an index of magazine contents—pointing up numerous possibilities for the publishing field, where speed and distribution are prime factors.

Writings in Latin, Hebrew, Russian, and Japanese—the original Japanese surrender document, in the latter case—showed Ultrafax's indiscriminate handling of all languages.

Borrowing from the treasures of the Library of Congress, Ultrafax brought to the audience these documents of our American heritage: The Declaration of Independence, in the handwriting of Thomas Jefferson; the battle map of the Battle of Bunker Hill; the first official government map of Washington, D. C.; the first printed copy of the National Anthem; the Gettysburg Address, in Abraham Lincoln's handwriting—the very copy he used for his delivery.

And finally, marking two of the most significant affirmations of man's progress, there was transmitted a page of the Gutenberg Bible—the first printed word—and the preamble to the Charter of the United Nations.

The unveiling of Ultrafax, which was televised from Washington to viewers on the NBC East Coast network, took place near the site of Professor Samuel F. B. Morse's historic demonstration of the telegraph 104 years ago.





AMPLE AISLES, ADEQUATE LIGHTING AND FLOORS KEPT SPOTLESS BY SANDING MACHINES ARE TYPICAL FEATURES OF THE "HOUSEKEEPING" PROGRAM FOLLOWED AT RCA'S BLOOMINGTON, INDIANA, PLANT.

## Safety and Health

*Success in Eliminating Occupational Hazards in Factories and in the Field Has Won Wide Recognition for the RCA Victor Division*



By E. M. Tuft

*Director of Personnel  
RCA Victor Division*

EVERYBODY loses from industrial accidents—men and management alike—the community, too. To prevent these losses the RCA Victor Division, from its very inception, has had in operation a Safety and Health Program which is constantly being improved to meet new conditions. It is looked upon as a model for the radio and phonograph industry.

Employing over 25,000 people in ten plants and in the field, RCA Victor, in its efforts to maintain the

safety and health of its employees, is confronted with a wide range of problems inherent to the extensive scope of its manufacturing activities.

Its cabinet plants in Pulaski, Virginia, and Monticello, Indiana, present the hazards of the wood-working industry, which by their nature are much greater than those encountered in radio manufacturing. The Camden, New Jersey, plant advances special problems involving the manufacture of bulky products, ranging from television and radio broadcast equipment to television receivers. The Bloomington, Indiana, plant by contrast emphasizes the good housekeeping needed for efficient mass production of small radios.

Entirely different types of problems are encountered in tube manufacture at Harrison, New Jersey; Lancaster, Pennsylvania; and Indianapolis, Indiana. The last named shares with Camden and the Canonsburg, Pennsylvania, plant special safety problems arising from record manufacturing activities, and together with the Camden plant, those

arising from production of relatively large units as typified by radio and television console receivers.

Field people, such as employees of RCA Service Company, who install and service many types of equipment, present still another series of problems.

Despite the wide range of conditions to be met, the RCA Victor Division long has enjoyed a better-than-average safety record, as compared with other firms engaged solely in radio manufacturing. Behind this accomplishment is the Safety and Health Program which has won wide recognition for the company as a leader in safety activities, and many awards to individual plants for their outstanding safety records.

Maintenance of employee safety and health is a major personnel policy of the RCA Victor Division. The program is a "down-to-earth" one, stressed as an operational function of each plant. In the company's larger plants, the program is coordinated by safety supervisors; in the others, by personnel managers. But, fundamentally, safety becomes the responsibility of each supervisor and group leader. These are the people who are "on the front line". It is their job to expose hazards and prevent accidents.

Rank and file participation in the

[RADIO AGE 23]

Public Library  
Kansas City, Mo.

Safety and Health Program is also encouraged. This begins with the training given to each new employee, or to an old one shifted to a new operation or machine. It carries over to the plant-wide safety committees, and sub-groups covering specific activities.

A primary consideration of the RCA Victor Division is the welfare of its employees. It is concerned with the prevention of the pain, the discomfort, and the resulting financial setbacks which victims of accident and illness may suffer.

#### *Program Helps Consumer*

There is a by-product for the consumer, too, in the Safety Program. The careful workmanship which avoids accidents assures the consumer of the dependability and high quality of the merchandise bearing the company's label.

How "safety thinking" pervades all activities of the company is illustrated by the extensive safety organization in a typical RCA plant.

At the head of this activity in each plant is the safety supervisor or chairman of the safety committee. The latter is composed of supervisory and engineering personnel. Under the direction of the safety supervisor is a dispensary, staffed with nurses and doctors; an emergency first aid crew; the general fire and safety committee; safety committees for special hazards such as X-ray and high voltage; and the staff of the safety section.

The safety supervisor works in close cooperation with the plant fire marshal; plant engineering, chemical engineering, and standardizing groups, within the company; and outside agencies such as the State

Department of Labor, the State Department of Health, Red Cross, local industrial safety council, and the National Safety Council.

At the periphery of the safety wheel, whose rim is comprised of the company's employees, are safety co-ordinators—one for each activity, including engineering, manufacturing, material control, central planning, plant engineering, power, building service, maintenance and construction, warehousing, quality, and purchasing. Many of these activities have safety sub-committees to act on their own problems. It is on this level that most of the educational and preventive safety work is done. If the sub-committee is stumped by a problem it has a two-way channel of communication to the plant's general safety and fire committee and the safety supervisor.

#### *Model of Effectiveness*

Despite its apparent complexity, this safety organization is a model of integration and effectiveness in operation. Frequent training sessions for supervisors, safety procedure indoctrination for all groups of trainee engineers, generous use of dramatic safety posters such as those put out by the National Safety Council, and day-in, day-out activities of the Safety Section hammer away at education and prevention.

One of the fundamentals of RCA Victor policy is compliance with all state and local laws and codes relating to safety and health measures. In practice, local compliance frequently exceeds statutory requirements.

At Camden, for example, it was necessary to store 50 pounds of

smokeless powder for use in an important test procedure of certain equipment. To store this amount of the explosive, New Jersey requires a "Class B Magazine" license. A "Class B Magazine" is a steel box, conspicuously lettered with the word "Explosives", mounted on wheels with a handle attached, so that in the event of fire the magazine may be pushed to safety.

RCA Victor, however, wouldn't take the chance of having to have the explosive pushed out of the building in the event of a fire. It built a "Class A Magazine", a brick building out in the yard remote from plant buildings. *In this structure, the "Class B Magazine" was stored.*

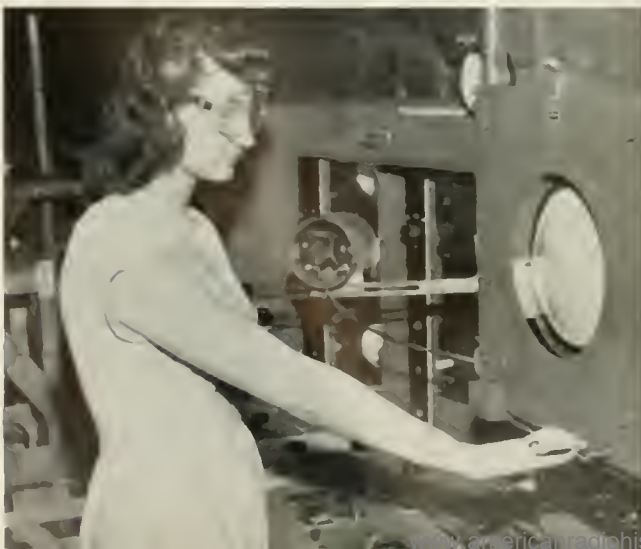
Preventive actions such as this are an everyday occurrence at all RCA Victor plants. In this Company, safety literally starts on the drawing board. Working closely with engineering, the safety staff is consulted on any new products, processes or procedures.

#### *New Machines Studied*

Safety precautions begin with the study of the materials specified for toxicity or other hazards. Then, the production procedure is analyzed and specifications set down for safe operations. If there are any new machines to be used, their plans are also carefully examined together with their lay-out, to make certain that no new hazards will be introduced. If a hazard is discovered in connection with a machine or piece of equipment, the mechanism is "tagged" with a bright yellow card, which means that it must

*(Continued on page 30)*

SAFETY GOGGLES FOR WORKERS AND PROTECTIVE CABINETS FOR KINESCOPE TUBES HAVE REDUCED THE POSSIBILITY OF EYE-ACCIDENTS.



O. C. BOILEAU (RIGHT) SAFETY SUPERVISOR AT CAMDEN, WATCHES A SUBSTANCE BEING TESTED FOR FLAMMABILITY IN THE CHEMICAL-PHYSICAL LABORATORY.





OLD AND NEW MEET IN A MADRID PLAZA WHERE A MONUMENT TO FERDINAND VII IS USED AS BACKGROUND IN TELEVISIONING A STREET SCENE.

## TELEVISION IN SPAIN

*Madrid Audiences Watch Telecasts of Dances, Street Scenes and Bullfights in Demonstration of American Video Equipment*

A high degree of success has been attained by the Radio Corporation of America in acquainting the Spanish people with the progress of American television. In a series of demonstrations conducted in Madrid by representatives of the RCA International Division, the latest types of RCA television receivers, cameras and relay equipment went into action at the Government Palace and in the ancient streets and plazas of the capital. Highlighting the performance were direct pick-ups from one of Spain's most famous bullfighting arenas.

Beginning in July with private showings for Spanish officials at the Palace, the demonstrations were continued until the latter part of August, with the cooperation of Rey Soria & Company, RCA distributors in Spain. The pick-ups featured typical dances of

Sevilla and Aragon, reviews of the Moorish Guards, presentation of American motion pictures and the traditional drama of "blood and sand." Sixteen of the newest models of RCA Victor television receivers reproduced the scenes transmitted by two mobile television units.

Despite early technical difficulties, the first television pick-ups of bullfights in Spain received enthusiastic response from the press and the hundreds of spectators who packed an amusement center, six miles from the celebrated Vista Alegre Arena, where the noted matador, Domingo Dominguin, staged the spectacle.

More than two hours before the television show got under way the theatre in downtown Madrid was crammed to capacity with some 2,000 bullfight fans, eagerly awaiting one of the early exhibitions.

In all, three Sunday bullfighting

"corridas" were covered by RCA television, and the famed impresario, Dominguin, had this to say about the introduction of the new television art into the ancient pastime of Spain: "I am extremely pleased that the Spanish people have had the opportunity of seeing television and of witnessing the televising of bullfights. It is a wonderful combination of the old and the new—of spectacular entertainment and science."

Several members of the RCA television crew were veterans of televising bullfights in Mexico last year. They were assisted by Spanish technicians who became quickly skilled in handling the video gear. After official and public demonstrations they participated in the send-off for the introduction of television in Spain.

The Madrid press received the bullfight coverage with enthusiasm, offering the consensus that in many instances the televised pictures of the events were brighter than the actual scenes in the arena.

The Madrid daily, *Hoja del Lunes*, declared editorially: "Perfect quality of pictures and sound was demonstrated by RCA television in covering the bullfights."

Another newspaper, *Diario Alca-*

USING A TELEPHOTO LENS, A TELEVISION CAMERAMAN FOCUSES ON ACTION IN A FAR CORNER OF A SPORTS ARENA.



[RADIO AGE 25]

Public Library  
Kansas City, Mo.

zar, said: "Spectators at the arena crowded around the television monitoring equipment near the end of last night's performance when heavy clouds caused poor visibility in the arena. The television viewers saw pictures that were much brighter than the actual scene in the arena."

The *Diario de Madrid* added: "RCA deserves warm praise for its television coverage of a Spanish bullfighting spectacle. Television enabled viewers many kilometers from the arena to see the events with excellent fidelity."

During the television demonstrations in Madrid the city displayed colorful posters advertising what it termed a "television corrida" and gave wide acclaim to RCA representatives and the distributing organization. At intervals, the noted Dominguin stood behind the RCA producer Ed Price, and advised him on camera shots. Dominguin, himself a sports impresario, announced that he hoped to employ television in coverage not only of bullfighting, but in other events such as boxing and wrestling, when television makes its permanent entrance into Spain.

In October, 1946, a television

crew of the RCA International Division journeyed to Mexico and demonstrated the RCA system with a series of pick-ups in the capital. There, success was achieved for the first time in the pick-up and transmission of bullfight scenes.

Later, in June, 1947, the first demonstration of the American television system on the continent of Europe was conducted by RCA at the Milan International Fair and at various other Italian sites, including Vatican City, where Pope Pius XIII was televised for the first time. These demonstrations were held in conjunction with the celebration in Italy of the 50th anniversary of the invention of radio.

Members of the RCA International Division's television crew who introduced the video art to Spain were William J. Reilly, C. E. Davis, T. J. Shipferling, F. W. Millsbaugh and Ed Price. On hand for the initial exhibition were Vice-Admiral William A. Glassford, European Manager of RCA; John F. Royal, Vice President and Assistant to the President, National Broadcasting Company; and Carlos Villalvazo, European Field Representative of the RCA International Division.

## 300 Engineers Complete Television Courses

More than 300 broadcast engineers from leading radio networks and independent stations in the United States, Australia, Canada, and Mexico, have completed the television technical training courses being conducted by the Engineering Products Department of the RCA Victor Division in Camden, N. J.

Conducted by "popular request" in Camden and also on the West Coast the week-long clinics acquaint broadcast technicians with the theory, design, operation, and maintenance of the latest television equipment. A combination of technical sessions and practical demonstrations familiarizes the engineers with problems concerning the installation and operation of television systems. Each course, staffed by the same RCA television engineers who designed the equipment and are familiar with every phase of its operation, is delivered at an engineering level.

Technical sessions include discussions of all aspects of television technical operation, ranging from fundamental theory to layout of television studios, kinescope photography, and the use of mobile television microwave equipment in the coverage of remote broadcasts.

Practical demonstrations for those attending the fifth clinic in the Camden series, were held in a newly constructed television studio where the visiting engineers witnessed a live video program from the control position. They also were given an opportunity to operate the cameras, control equipment, and the 16mm and 35mm projectors used in televising motion picture film. In adjoining laboratories, they viewed demonstrations of RCA's 7000-megaeye relay equipment used for relaying television programs between remote pickup locations and the studio.

Included in the training programs were a tour of the transmitter production plant and inspection trips to RCA's experimental television station W3XEP and RCA Laboratories in Princeton, N. J.

SCENES SUCH AS THIS, PICKED UP BY AN IMAGE ORTHICON CAMERA FROM A LOCAL BULLFIGHTING ARENA WERE SHOWN IN A CROWD-PACKED MADRID THEATRE.



# Pack Transmitters Grow Smaller

*Latest Model Weighs Only 24 Pounds, Complete with Batteries, and Has a Range Up to 20 Miles*

The first known successful broadcast using a pack transmitter was made in 1929 by a parachute jumper who described the sensations of his descent to earth as an NBC feature. The pack transmitter used by that hardy and unknown soul was quite heavy, had only fair tonal quality, was somewhat unstable in the frequency of its signals and could be operated only for short periods due to limited battery life. However, the broadcast was successful and created widespread interest.

Since that time, the pack transmitter has become an essential tool of the broadcaster. Portable, low-powered, high-frequency self-contained stations of this general type are now used extensively for the relaying of sound broadcasts during golf matches, parades, street interviews and at large assemblages, such as political conventions.

But the size as well as the capabilities of the instrument have undergone noteworthy evolution. These improvements are typified in the latest model developed within the past year by NBC engineering talent.

In the Spring of 1947, George McElrath, NBC engineer executive, called in Jarrett L. Hathaway, NBC's assistant manager of engineering development—then a staff engineer—and told him the network needed seven new pack transmitters for its owned and operated stations and for Western Division headquarters at Hollywood. Hathaway investigated the possibility of getting seven pack transmitters of existing types in a hurry. But a thorough study of the situation convinced him that such a project would be excessively expensive. In addition, the current models were ten years old with tubes and circuit already obsolete, moreover, the method of controlling the frequency was not sufficiently accurate to meet the Federal Communications Commission's new standards. Hathaway knew, too, as did the other engineers—and especially the field

men—that the units then in use were too big, too heavy and too cumbersome.

This whole situation represented a challenge to any engineer charged with the procurement of new electronic equipment, so Hathaway determined to design a new pack transmitter that would be lighter, smaller and more efficient.

Forthwith he set to work on the basic circuit and after a short time, when he was satisfied with the foundation, he called in William Hotine, NBC development engineer, who added the mechanical details and refined the electrical circuits. Time devoted to the project from the start through the stage of manufacture was over a year, and in May, 1948, the pack transmitter was approved by Hathaway from an engineering standpoint.

The following month, it was used on the air for the first time during



J. L. HATHAWAY HOLDS THE LATEST STREAMLINED MODEL OF THE PACK TRANSMITTER. BATTERIES TO OPERATE THE UNIT FOR 6 HOURS ARE INSIDE THE CABINET.



THIS EARLY VERSION OF THE PORTABLE TRANSMITTER WAS LARGE AND CUMBERSOME AND REQUIRED A LENGTH OF WIRE FOR ITS ANTENNA.

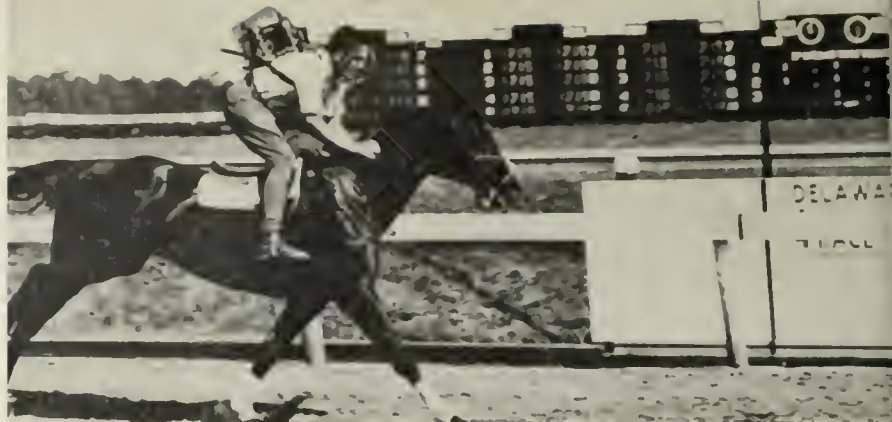
the broadcast of a golf match in Hollywood. That particular pack transmitter had been brought to Hollywood for the National Association of Broadcasters convention in May, and was left there with NBC Western Division engineers. This was the pack transmitter that was used fairly extensively at the recent major political conventions in Philadelphia for remote pickups and for cue-channel transmission. The latter provides off-the-air cues and conversations between remote points and control booths.

The new pack transmitter is high quality, low powered and high frequency, designed for remote pickup of sound broadcast programs when extreme mobility and freedom of action are required. It is about one-third smaller in size and weight than previous models, yet is capable of improved performance. The saving in space and weight was made possible by the type of construction employed, together with the use of miniature components, including tubes. Other features are simplified tuning controls, high level modulation, automatic audio gain control,

[RADIO AGE 27]

high frequency pre-emphasis and high quality monitoring.

The newest pack transmitter has been designed for use within the 25 to 32 megacycle frequency band. The external housing dimensions are only  $9\frac{3}{4}$  inches wide by  $12\frac{1}{4}$  inches high by  $5\frac{3}{8}$  inches in depth. This size permits easy carrying, since the unit does not protrude too far from the back, and the height is small enough to avoid the annoying bumping of the lower edge against the hip of the operator—a common curse of the older transmitters. The overall weight, including batteries and protective cover, is only 24 pounds. Batteries provide about six hours of continuous operation, which corresponds to about fifteen hours of operation at a rate of one hour a day. Range is



WITH PACK TRANSMITTER AND BATTERIES STRAPPED TO HIS BACK AN EXERCISE BOY GIVES A RUNNING ACCOUNT OF HIS JAUNT AS A BROADCAST FEATURE FIFTEEN YEARS AGO.

one to twenty miles, depending on extraneous noise at the receiving location and also on the nature of the terrain over which the signals must travel.

Diligent research through the

intervening years has made possible the several successively smaller and more efficient pack transmitters. No one will venture a prediction as to the limit of improvement which one day may be reached.

## RICHMOND, VA., INSTALLS 2-WAY RADIO FOR POLICE

*More Than a Hundred Mobile Units Provide Protection to City*

ONE of the nation's largest high-frequency two-way police communications systems was recently installed and put in operation by the City of Richmond, Virginia, using equipment supplied by the RCA Engineering Products Department. The system, broadcasting over Station WPHF, operates at 155.01 megacycles for the station transmitter and mobile receivers, and at 156.09 megacycles for the mobile transmitters.

Richmond's original police communications system, which went into service in 1932 with one 400-watt station transmitter and 24 mobile

receivers, operating in the 2450 kc low-frequency band, today boasts a 250-watt high-frequency transmitter, two auxiliary 45-watt transmitters, and more than a hundred two-way mobile units. These units mounted in police cars, fire-fighting equipment, city ambulances, and other city-owned vehicles, give complete protection to Richmond, its harbor, and residents of adjoining Henrico County.

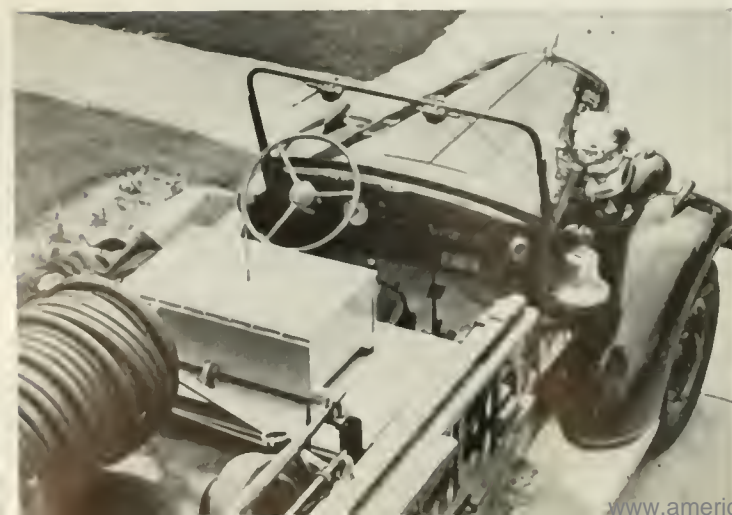
The main transmitter has been installed atop the Carillon, a World War I memorial, with auxiliary units housed in the Second Precinct Police Station and aboard a tug in the harbor. An antenna, mounted approximately 275 feet above ground, serves the main station. Continuous two-way communication with this unit has been successful over a distance of approximately 70 miles. A new radio room, remodeled

with such modern features as air conditioning, acoustic tiling, modern lighting, and fireproof furnishings, is operated twenty-four hours daily, and averages some 600 calls and about 1800 transmissions per day.

The RCA main station and two RCA auxiliary stations are all remotely controlled from two RCA remote control amplifiers located at Police Headquarters, approximately three miles from the transmitters. A system of duplex control makes it possible for either of two dispatchers to select and control the main transmitter or the auxiliary transmitters. The remote control equipment is also used to supply both out-going and in-coming calls to the three precinct stations, Police-Fire alarm office, Henrico County Police Headquarters, and six other offices via telephone lines.

TWO-WAY RADIO UNIT ON ONE OF RICHMOND'S FIRE TRUCKS IS LOCATED DIRECTLY BEHIND THE DRIVER'S SEAT.

THROUGH THIS CENTRAL RADIO CONTROL BOARD, RICHMOND OPERATORS HANDLE AN AVERAGE OF 1800 TRANSMISSIONS A DAY.





SCENE IN THE HOLLYWOOD STUDIO DURING THE FILMING OF "THE PUBLIC PROSECUTOR", FIRST MYSTERY SERIAL PRODUCED FOR TELEVISION.

## FILM DRAMAS FOR TELEVISION

*First Serial Produced Exclusively for Video Stations to be Released Soon in 26 Installments*

THE first dramatic serial feature to be filmed especially for television will shortly be shown to NBC video audiences throughout the country. The series, entitled "Public Prosecutor", consists of twenty-six stories each seventeen and a half minutes in length with an additional two minutes of running time for commercial messages, and thirty seconds to advertise the next installment.

As a television attraction, these "whodunit" programs will augment the kinescope recordings, also produced by NBC, which have been used by NBC affiliates located in

cities not yet supplied with coaxial cable or radio relay service.

A radical departure from current video programming, the films for television feature a new technique. Every foot has been shot solely with the television audience in mind with special attention given to close-ups rather than long shots. This intimate approach brings viewers into the story until they feel that they are actually aiding the Public Prosecutor in tracking down the criminals.

Produced in Hollywood by Jerry Fairbanks, the series stars John Howard and features a cast of well-

known players. Critics who have seen previews have been enthusiastic in their reports. *Newsweek* called the series the best news the home televiewer has had "since the World Series".

Through the NBC Television Recording System—a system of taking motion picture film off the face of a kinescope—the televiewer receives picture quality equal to the best sixteen millimeter home motion pictures.

### *Developed Over Ten-Year Period*

Television recording was developed over a period of ten years by NBC engineers working under the supervision of O. B. Hanson, vice president and chief engineer. Difficult technical problems, once thought insoluble, were overcome and the system is now a working reality.

The system received its baptism of fire with the two national political conventions. While the conclaves were under way, engineers in New York stood by with the recording cameras to put on film all the highlights in Philadelphia.

The NBC Television Recording System provides the method of syndication for the network to bridge the gap until interconnecting facilities are available. Although the

"HOWDY DOODY", POPULAR JUVENILE PROGRAM, IS BEING DISTRIBUTED TO AFFILIATED TELEVISION OUTLETS BY MEANS OF KINESCOPE RECORDINGS.



[RADIO AGE 29]

midwest television chain centering around Chicago will be connected with the East Coast by Jan. 1, 1949, there will be many NBC Television stations which will not be on the network for some time. Thus, the recording system will provide an effective interim networking arrangement.

At the beginning of September, six major NBC Television Feature Service program series were offered to non-interconnected video outlets of the network. This marked the first regular use of the system. The series were: "Musical Miniatures," televised three times weekly, on the east coast network and featuring well-known pianists and singers; Richard Harkness' "Story of the Week," a fifteen-minute interview program with leading personalities in the news; "Stop Me If You've Heard This One," starring Morey Amsterdam, Cal Tinney and Lew Lehr, a half hour comedy program; "America Song," a quarter hour of song and dance; "Howdy Doody", the ever-popular children's program starring Bob Smith; and "Television Screen Magazine" featuring Bob Stanton and interviews. As time goes on, it is expected that all NBC Television programs—both commercial and Feature Service—will be made available to network video stations wherever they may be located.



TELEVISION STATIONS BEYOND THE REACH OF COAXIAL CABLES AND RADIO RELAYS, TRANSMIT THE SONG AND DANCE PROGRAM "AMERICA SONG" FROM KINESCOPE RECORDINGS MADE IN NEW YORK.

## Safety and Health

*(Continued from page 24)*

be shut down until the hazard is eliminated.

It is the seemingly little things that make for good safety—such as having walkways free from hazards in a plant like Indianapolis, where large consoles are moved on conveyors; or, like the marking of certain areas in the Lancaster tube plant, where no one, — and this means no one without exception — is permitted to enter without special types of goggles. It means, also, having the kind of housekeeping in the Bloomington small radio plant that has led to repeated remarks by a factory inspector of the Indiana Department of Labor that this was

"the cleanest, best-kept plant of all those in my jurisdiction."

Pre-occupation with detail doesn't mean that the Safety organization overlooks the big things. When the Camden plant was converted from war to peacetime production, every design for machine lay-out, every new machine, every new process was carefully studied from drawing board to actual operation for elimination of hazards. RCA went even further. It obtained approval from the New Jersey Department of Labor for all of these installations, frequently exceeding State standards.

The end-product of these activities and the thorough-going safety

organization is the knowledge that employment at RCA Victor is safer than the average in the radio and phonograph industries.

At the Camden plant, largest of the ten comprising the RCA Victor group, there has not been a punch press accident in almost two years. On all other power machines, manned with an average of about 13,000 workmen, there have been only 11 accidents in the past year. This splendid record shows up in the accident frequency rate in 1947 of only 4.8 per million man-hours worked, as compared with the industry average of 6.2.

Other RCA plants, too, compare favorably with the industry average. All of them are constantly striving to find better and safer ways of doing things.

[30 RADIO AGE]





RED SEAL



Cunningham

RADIOMARINE

RCA VICTOR

VICTROLA

RADIOTRON



Via RCA



the ancient Babylonian and Egyptian brickmakers applied unique identification marks to their bricks. Roman craftsmen often applied their names to their products. In Germany, Venice and England, back in the 14th, 15th and 16th centuries, members of different guilds were placing their guild and personal marks on their respective goods. The bakers, printers, cutlers, cloth-makers and leatherworkers of those times were controlled by extremely rigid guild rules. To fix responsibility for poor workmanship and to identify the particular craftsman's work, it became the custom to apply an identification device or symbol to a product. From these crude beginnings, where the mark was actually a symbol of liability, there evolved the asset trade-mark of the 19th and 20th centuries.

In our modern free and democratic society there is a vast importance in trade-marks. They are socially significant. Americans are trade-mark conscious people. Whether you are a factory worker, an office worker, middle class or wealthy, you shop and buy according to established brands. It makes little difference if you are highly educated or illiterate; your brand or trade-mark consciousness is of intense interest to small business and big business.

The average purchaser likes the freedom to choose among well-known brands. A consumer survey showed that 85 per cent of all people readily recognized that the letters "GE" mean General Electric. The public readily recognizes and relies on our "RCA" trade-mark, and when broadcast listeners hear the familiar chimes on the radio they know at once that they are listening to their favorite "NBC" network.

Taking a closer look at the modern trade-mark, it quickly becomes evident that something new was added to the old guild system mark. Besides identifying the product, its origin, and guaranteeing a stable quality, the modern trade-mark advertises the product. Justice Felix

## The Meaning of Trade-Marks

*These Familiar Symbols Are Essential Tools of Industry which Create and Maintain Good-Will Toward Company and Product*



By Abraham S. Greenberg

*Trade-Mark Attorney,  
Radio Corporation of America*

keep its trademarks in prominence are legion. Newspaper and magazine advertisements; the lure of prize contests; radio network programs with their highly paid stars and well-known orchestras; car cards in trains and buses—these are only a few of the methods that are proving effective in perpetuating and strengthening trade-marks.

Trade-marks by themselves do not sell goods, but properly exploited they create that highly valued business asset called good-will. Like a powerful magnet, good-will attracts the shopper and buyer to a specific product. Customers are already half-sold if they have acquired confidence in the integrity of the maker of a line of goods. Good-will engenders a sense of reliability.

Trade-marks have a pedigree; they go far back to the days of the guild system. Evidence shows that

**T**RADE-MARKS, and the Good-will they create are essential tools of industry, yet few laymen realize to what extent they are vital to the successful conduct of business enterprise. Rarely does the man-in-the-street appreciate their effect on the safety, health and buying confidence of the public.

The devices used by business to

Frankfurter put it very nicely in these words:

"The protection of trade-marks is the law's recognition of the psychological function of symbols. If it is true that we live by symbols, it is no less true that we purchase goods by them. A trade-mark is a merchandising short-cut which induces a purchaser to select what he wants, or what he has been led to believe he wants. The owner of a mark exploits this human propensity by making every effort to impregnate the atmosphere of the market with the drawing power of a congenial symbol. Whatever the means employed, the aim is the same—to convey through the mark, in the minds of potential customers, the desirability of the commodity upon which it appears. Once this is attained, the trade-mark owner has something of value."

#### *Trade-Mark Is a Property Right*

It is interesting to compare a trade-mark with such business values as patents, copyrights, trade secrets, "know-how", the skill, experience and reputation of personnel. Patents and copyrights are property rights which arise out of a grant by the Government. Most of the assets of a business enterprise have a vitality and power of their own which permit them to function independent of the business. A trade-mark, however, is a property right which comes into existence only through use by its owner as a distinctive mark in connection with a given product. Once separated from the article or business to which it refers, the trade-mark becomes meaningless and will perish as a trade designation.

A trade-mark may be said to be a distinctive word, emblem, symbol or device used to identify the maker or distributor of a given product. While trade-marks are protected by the courts, whether registered or not, State and Federal trade-mark registration give substantial benefits to trade-mark owners.

One of the highlights of this new Federal Trade-Mark law is the formal recognition and registration

of a service mark. These are marks used by laundries, cleaners, banks, insurance companies, radio broadcasters and others whose services are rendered interstate. A service mark means a mark used in the sale or advertising of services to identify the services of one person and to distinguish them from the services of others. They include without limitation the marks, names, symbols, titles, designations, slogans, character names, and distinctive features of radio or other advertising used in commerce. For example, the letters "NBC" and the chimes used in the broadcast service of National Broadcasting Company, the RCA monogram as used in the radio communication services of RCA Communications, Inc., the word "Radiomarine" used to indicate the services rendered by Radiomarine Corporation of America—all of these are service marks.

The selection of a suitable trade-mark is not an easy task. It should not be a descriptive word, a geographical name, or in general any symbol or device which others may employ with equal truth and have an equal right to use for the same purpose. The mark should be searched in the U. S. Patent Office or other suitable search source to make sure that the desired mark is not similar to a prior mark. In brief, a good trade-mark or service mark is distinctive, has a psychological appeal, is suitable for the product or service, is euphonious and is easy to remember.

From its formation in 1919, RCA has considered trade-marks one of its foundation stones. In this respect, General Sarnoff, only a short time ago, said:

"RCA's trade-marks are among its most valuable assets. They are a symbol of the intangible value of the 'good-will' between RCA and the public which we have painstakingly and at great cost built up over the years. No improper use of trade-marks should be permitted to impair that investment in effort and expense."

How well the Radio Corporation of America, its divisions and sub-divisions have promoted their trade-marks is evidenced by recalling some of their symbols which through ceaseless reiteration have become household words both at home and abroad. "RCA", "RCA Victor", the familiar dog and phonograph "His Master's Voice", "Victrola", "Radiotron", "Red Seal", "Via RCA" and "NBC". Behind these widely advertised trade-marks and service marks stand the integrity and reliability of the manufacturer, the distributor and the dealer.

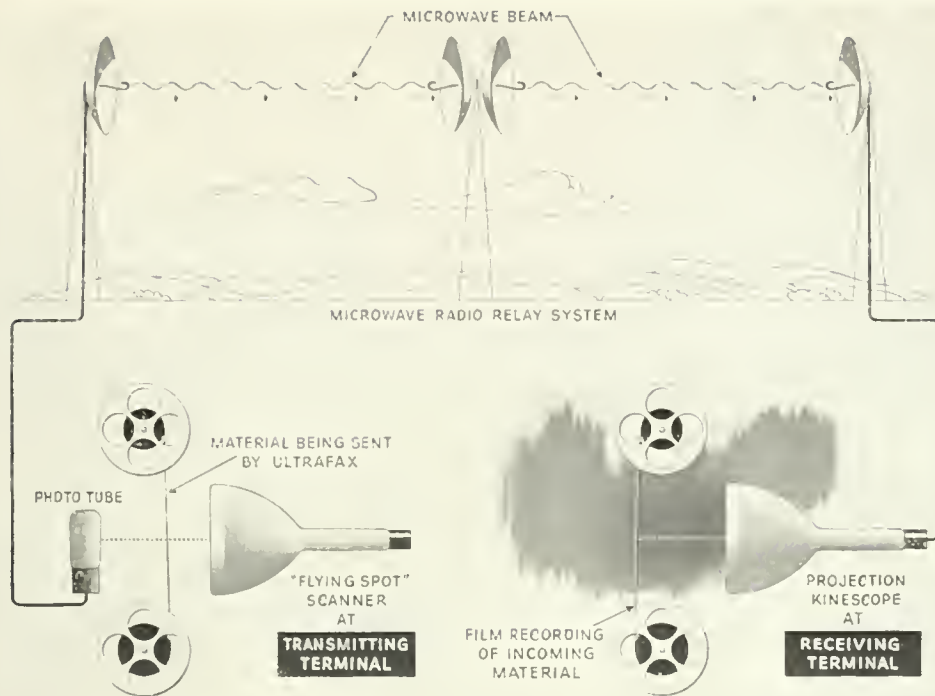
However, there is more to a trade-mark than merely coining it and promoting it. If it is to remain an asset, it must be zealously watched and protected. As it becomes more valuable, it becomes more vulnerable. Many are the devices resorted to by an unscrupulous competitor in his attempts to promote his own wares by preying on the glowing good-will of another. Courts have ruled repeatedly that the proprietor of good-will is entitled to "protection against one who attempts to deprive him of the benefits resulting from the same, by using his labels and trade-marks without his consent and authority."

While it is true that RCA from time to time has enriched the stockpile of everyday language with coined words such as iconoscope, kinescope, orthicon, loran, shoran, teleran, the Corporation's basic marks are guarded with all the force that can be assembled. For these are the tireless salesmen of RCA.

## States Position on UHF

*(Continued from page 12)*

orderly progression leading toward assignment of additional channels will permit the radio industry and the broadcasters to make concrete plans for expansion of television service to the American people and to do this without disturbance and with full realization of the best public interest."



PERIODICAL DEPT.

SIMPLIFIED DIAGRAM OF A COMPLETE ULTRAFAX SYSTEM SHOWING THE PRINCIPAL ELEMENTS WHICH MAKE POSSIBLE THE MILLION-WORDS-A-MINUTE TRANSMISSION SPEED OF THE NEWLY DEVELOPED MEDIUM OF COMMUNICATION.

# Ultrafax: Million Words a Minute

*Sarnoff Foresees Ultrafax Opening New Era in National and International Communications—He Urges Study Looking Toward the Establishment of a New National Communications Policy*

ULTRAFAX, a newly developed system of television communications capable of transmitting and receiving written or printed messages and documents at the rate of a million words a minute, was demonstrated publicly for the first time by the Radio Corporation of America at the Library of Congress, Washington, D.C., on October 21.

Brigadier General David Sarnoff, President and Chairman of the Board of RCA, declared that Ultrafax, which splits the seconds and utilizes each fraction for high-speed transmission of intelligence, is as significant a milestone in communications as was the splitting of the atom in the world of energy.

Among the possible developments which General Sarnoff foresaw were:

1. The exchange of international television programs achieved on a transoceanic basis.

2. A service of television and Ultrafax by which the same receiving set would bring various types of publications into the home, or a newspaper for that matter, without interrupting the program being viewed.

3. A system of world-wide military communications for this country, scrambled to the needs of secrecy, which with ten transmitters could carry in sixty seconds the peak load of message traffic cleared from the Pentagon Building in twenty-four hours during the height of World War II.

4. The establishment of great newspapers as national institutions, by instantaneous transmission and

reception of complete editions into every home equipped with a television set.

5. The transmission of a full-length motion picture from a single negative in the production studio simultaneously to the screens of thousands of motion picture theatres throughout the country.

6. The possibility of a new radio-mail system with the vast pickup and delivery services of the Post Office Department.

Representatives of the United States Armed Forces, Government agencies, industry and the press witnessed the introduction of this advanced communications system. RCA presented the demonstration as a "progress report" to show that the system has reached a stage of development where plans can be